Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 57, NO 2, FEBRUARY 1989

SPECIAL REFERENCE ISSUE

KENWOOD

AMATEUR LINE-UP

Kenwood's amateur lineup for 1988 incorporates the latest developments in communications technology.

Superior front end specifications are accompanied by the latest developments in transmitter design. Automatic antenna tuning and advanced digital & microprocessor technology make these the easiest to operate Kenwoods ever.

Personal computer control is available on several models.

HF

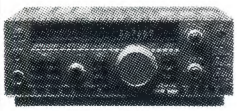
TS-940S

Competition Quality HF Transceiver. Transmitter: SSB, CW, AM, FM and FSK. 160-10 metres bands. Output: 250W PEP. Automatic antenna tuner. Receiver: 150kHz-30MHz continuous. 40 memories, programmable and band scans. Power requirement: 240VAC, 50/60Hz.

TS-440S

Compact HF Transceiver. Transmitter: SSB/CW/FM/AFSK. 160-10 metre bands. Output: 200W PEP. Optional automatic antenna tuner. Receiver: 100kHz-30MHz continuous. Power requirement: 12-16VDC/20A max.

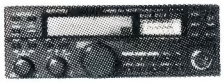
1.8-50MHz



TS-680S

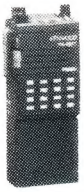
High performance HF & 6 metre Transceiver. Transmitter: SSB/CW, AM and FM modes. 160-6 metre bands. Output: 100W PEP (160-10m) 10W (6m). Receiver: 500kHz-30MHz continuous. Memory scan/band scan. Power req.: 12-16VDC/20A max.

VHF UHF



TR-751A TR-851A

All-mode Transceivers. Frequency Range: TR-751A: 144-148MHz. TR-851A: 430-440MHz. Transmitter: SSB/CW/FM modes. Output: 25W. Receiver sensitivity: less than 0.11uV (TR-851A). Features include: Auto-mode selection, dual digital VFOs, 10 memories plus "COM" channel. Optional Digital Channel Link System. Power req.: 13.8V ±15% 7.5A max.

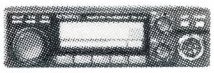


TH-25A TH-45A

FM Handheld Transceivers. Frequency range: TH-25: 144-148MHz. TH-45: 430-440MHz. Output: 5W. Receiver sensitivity: less than 0.16uV (TR-25). 14 multi-function memories, memory scan and band scan. Power req.: 6.0-16VDC/1.2A max.

TS-711A TS-811A

All-mode Transceivers. Transmitters: modes SSB/CW/FM. Frequency range: TS-711: 144-148MHz. TS-811: 430-440MHz. Output: 25W. Receiver sensitivity: less than 0.2uV (TS-811). Features include: 40 multi-function memories, programmable band scan and memory scan plus programmable memory channel lockout. Power req.: 240VAC, 13.8V DC/8.0A max.



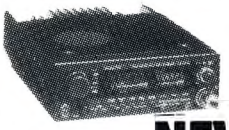
TM-221 TM-421

FM Mobile Transceivers. Transmitters: Frequency range: 144-148MHz (TR221) 430-440MHz (TR-421). Output: 45W (TM-221) 35W (TM-421). Low power switch to 5W. Receiver: Frequency Range: 130-173.995MHz (TR-221) 438-449.995MHz (TR421). Sensitivity: less than 0.16uV. Power requirements: 13.8VDC ±15%/9.5A max.

TH-215A TH-415A

FM Handheld Transceivers. Transmitters: Frequency Range: 144-148MHz (TH-215) 430-440MHz (TH-415). Output: 5W/0.5W (Hi/low). Receiver: 141-163MHz (TH-215) 430-440MHz. Scan modes include: band, memory and programmable band scans with 3 scan stop modes. Power requirements: 7.2-16V/2.0A max.

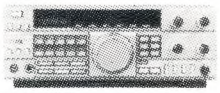
VHF/UHF DUAL BANDER



TM-721A NEW

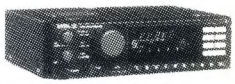
Dual band FM Transceiver with across band duplex. New for 1988, with dual watch, selectable full duplex cross band operation, automatic band change, 30 memory channels. Transmitter: Frequency Range: 144-148MHz/430-440MHz. Output: 45W (VHF) 35W (UHF). Receiver sensitivity: 0.16uV (UHF).

RECEIVERS



R-5000

Communications Receiver. The R-5000 is a competition class communications receiver. It receives all modes (SSB, CW, AM, FM, FSK). Frequency coverage is 100kHz to 30MHz in 30 bands. Selectable IF filters and dual-mode noise blanking are incorporated. Power requirements: 240VAC or 13.8V DC.

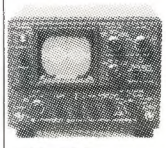


RZ-1

Wide Band Receiver. The RZ-1 covers 500kHz-905MHz. Features include: AM and FM reception, 100 easy to operate multi-function memory channels. Scan modes include VFO scan and memory scan plus programmable channel lockout. Power requirements: 11-16V DC/1A max.

MISC.

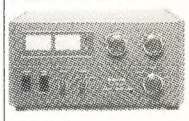
STATION MONITOR



SM-220

Based on a wide-frequency range oscilloscope, it combines a two tone generator, a wide variety of waveform observing capabilities.

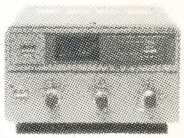
HF LINEAR AMPLIFIER



TL922

A class AB_2 grounded-grid linear amplifier. Covers 160-10m for SSB, CW and RTTY modes. Drive Power: 80W for full output. RF Input Power: 2,000W PEP (SSB).

ANTENNA TUNER



AT-250

Optional automatic antenna tuner for the TS-680S. Features full coverage of 160-10 metres. Insertion loss less than 0.8dB. Through power 150W.

REMOTE CONTROL HANDSET

RC-10

Connects to models TM-221, TM-421, TM-721. Provides all functions on the front panel. Will link together models TM-221/TM-421.

Kenwood Electronics Australia Pty Ltd

4E Woodcock Place, Lane Cove
Sydney, 2066, New South Wales
For your nearest dealer, please contact
PH: (02) 428 1455

Amateur Radio

Special Features

1989 Reference Section — 23-50
(includes band plans, VK and ZL beacons and repeaters, VHF, UHF and SHF records, DXCC countries list, AMSAT information, and much, much more!)

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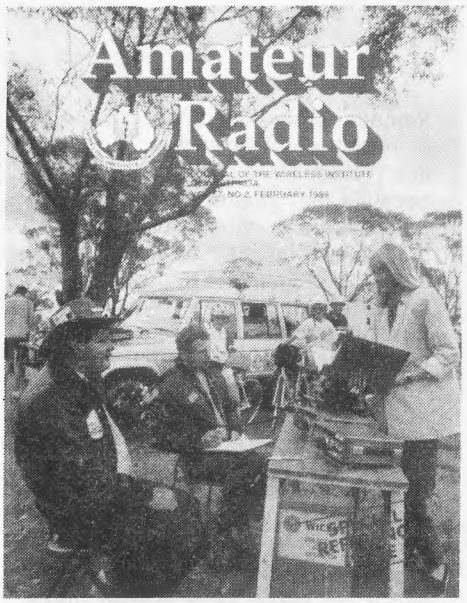

Cover:
WICEN check-point on the Melbourne - Sydney Bicentennial Bike Ride (see story page 8) Leanne Saunders of Hampton, Victoria, checking details with Tom Corrigan VK3XBG, and Richard Counsel VK3YLZ. Picture taken by Barry Wilton VK3XV.

Deadline for Mar 89 is 8 Feb.

Amateur Radio

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Materials should be sent direct PO Box 300, Caulfield South, Vic. 3162, by the second Wednesday of the month preceding publication. Check page 1 for deadline dates. HAMADS should be sent direct to the same address, by the following Tuesday.

Acknowledgement may not be made unless specifically requested. All important items should be sent by Certified Mail. The editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING :	Redfords Media Suite 1, 5 Walworth Ave, Caulfield Nth, 3162 Tel: (03) 523 0035
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EDITOR'S COMMENT
AMATEUR RADIO FEBRUARY 1989

This issue is different

As mentioned last month, that issue (January 1989) was the last to be produced by Betken Productions. This issue, for February, is different for several reasons.

Firstly, production, typesetting and printing are now all being carried out by different people than those involved before.

Secondly, for several reasons all of which involve saving expense to you, our members, we are publishing in this issue all the administrative and operating data which in the past has been published in the Call Book, but from now on we plan to publish it each year in the February issue of AR.

Thirdly, as many of you have told us over the last several years, the size and spacing of our typescript has, although improved over that period, still been a little small for comfortable reading, particularly by some of our older members, So, in this issue we decided to "go the whole hog" and increase the type size too!

Finally, although it is yet to be confirmed that we can keep up the pressure, with this issue we are operating on a much shorter lead-time from receipt of copy to publication, So things like DX information, news items etc should be more up to date from now on. But please don't judge us on that from this issue, because the Christmas-New Year holiday period has introduced some extra delays, as it does every year.

Due to the number of pages needed for the data section, we have had to cut down this month in several other areas, notably technical articles, but we will be back to our normal balance of material in all other months but February each year.

One other factor which we hope has had little unwelcome effect is that your editor and his good lady have just returned from a rather hectic but very enjoyable holiday in Tasmania, during which we talked (and listened much more!) to some of the VK7s on 2m FM as we drove around the island, covering 2500 km in 10 days. Tasmania doesn't look all that big on a map, by comparison with VK6 or VK4, but its distances should not be under-estimated either!

So there it is - the February 1989 issue. It may not be perfect but it's certainly different!

Bill Rice VK3ABP
Editor

QSP

Subscription drive winner

The WIA Executive Office has been pursuing the reasons in recent times as to why some members do not renew their membership. This is done to ascertain what the WIA needs to change to be able to retain its members.

Last year, we implemented a drive to find out why members had not renewed their subscription, and offered an incentive prize to those who were prepared to participate.

We thank all who participated.

WIA is pleased to advise the winner was Alan, VK7ZLA, who has now received a refund of his membership subscription.

WIA DIRECTORY

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Kevin Olds	VK1OK	ACT Councillor
Peter Jeremy	VK2PJ	NSW Councillor
Peter Mill	VK3ZPP	Victorian Councillor
David Jerome	VK4YAN	Queensland Councillor
Rowland Bruce	VK5OU	SA Councillor
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Joe Gelston	VK7JG	Tasmanian Councillor

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Awards Mgr	Ken Gott	VK3AJU
Contest Mgr	Frank Beech	VK7BC
Education	Brenda Edwards	VK3KT
EMC	Hans Ruckert	VK2AOU
Historian	John Edmonds	VK3AFU
Intruder Watch	Bill Horner	VK4MWZ
Int'l Travel Host Exch	Ash Nallawalla	VK3CIT
QSL Mgr	Neil Penfold	VK6NE
Standards	Peter Page	VK2APP
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DIVISIONS

Div	Address	Officers			Broadcasts	Fees	
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Alan Hawes Alex Johnson Ken Ray	VK1WX VK1ZDX VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun	Full (F) Assoc A Full (C) Assoc (T) Pens. (G) Stud. (S) Family (X)	$44.00 $44.00 $44.00 $44.00 $33.00 $31.00 $25.00
VK2	NSW Division 109 Wigram St Parramatta NSW 2150 (PO Box 1066 Parramatta) Phone (02) 689 2417	President Secretary Treasurer	Roger Henley Andrew Keir David Horsfall	VK2ZIG VK2AAK VK2KFU	(R Denotes repeater) Times 1100 and 1930 on Sun 1.845 MHz AM, 3.595 SSB, 7.146 AM (1100 only) 28.320 SSB, 52 120 SSB 52.525 FM 144.120 SSB 147.000 FM(R) 438.525 FM(R) 585.500 (ATV Sound) Relays also conducted via many repeaters throughout NSW.	F A C T G S X	$41.50 $39.50 $41.50 $39.50 34.50 31.00 24.50
VK3	Victorian Division 412 Brunswick St Fitzroy Vic 3065 (to be changed early 1989)	President Secretary Treasurer	Jim Linton Peter Mill Rob Halley	VK3PC VK3ZPP VK3XLZ	1.840 MHZ AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura 438.075 FM(R) Mt St Leonard 1030 hrs on Sun	F A C T G S X	$50.00 $45.00 $50.00 $45.00 $38.00 $27.00 $27.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 349 7768	President Secretary Treasurer	David Jones John Aarsse Neil Fittock	VK4NLV VK4QA VK4NEF	3.650 MHz, 7.118, 14.342, 18.132, 21.175, 28.400, 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Mon	F A C T G S X	$45.00 $45.00 $45.00 $45.00 $36.00 $27.00 $27.00
VK5	South Australian Division Thebarton Rd West Thebarton SA 5031 (GPO Box 1234) Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Don McDonald Hans vander Zalm Bill Wardrop	VK5ADD VK5KHZ VK5AWM	3.550 MHz, 14.175, 28.470, 53.100, 147.000 FM(R) Adelaide 146.700 FM(R) Mid North 146.900 FM(R) South East ATV Ch 34 579.00 Adelaide ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sun	F A C T G S X	$44.00 $44.00 $44.00 $44.00 $35.00 $26.00 $26.00
VK6	West Australian Division GPO Box 10 West Perth WA 6005	President Secretary Treasurer	Christine Bastin Fred Parsonage Cliff Bastin	 VK6ZLZ VK6PF VK6LZ	146.700 FM(R) Perth, at 0930 hrs Sun, relayed on 3.560 MHz, 7.075, 14.110, 14.175, 21.185, 28.485, 52.080, 438.525(R) Country relays 3.582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) Broadcast repeated on 3.560 at 1900 hrs.	F A C T G S X	$42.00 $42.00 $42.00 $42.00 $35.00 $22.00 $23.00
VK7	Tasmanian Division PO Box 1010 Launceston TAS 7250	President Secretary Treasurer	Mike Wilson Peter Frith Peter King	VK7ZWW VK7PF VK7ZPK	146.700 MHZ FM (VK7RHT) at 0930 hrs Sun relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.170, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	F A C T G S X	$42.00 $42.00 $42.00 $42.00 $38.00 $24.00 $22.00

VK* (Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).
Note: all times are local. All frequencies MHz.

WIA NEWS

JANUARY 1988...OOPS...1989 ISSUE OF AMATEUR RADIO

Most of us, when we make a mistake in our work, are fortunate that only one or two people (hopefully, not including the boss) ever find out about it. When the WIA makes a mistake with Amateur Radio, 8000 eagle-eyed members immediately have a talking point and rush to tell us about it. Particularly if the mistake is on the front cover of the magazine.

Are you wondering what I am talking about? Do you mean to say that you are the only member who didn't rush to tell me that we had the wrong year on the front cover of the January 1988..er..1989 edition of Amateur Radio?

One small saving grace is that at least we had the Volume Number correct, and the date is correct on the internal pages. What a pity that this error occurred on the last issue of the magazine that was produced by Betken Productions.

HAMADS

If you are an "average" reader of Amateur Radio then it is fairly safe to bet that the first part of the magazine you read each month is the HAMADS. And it is also fairly safe to assume that you have been wondering why the number of HAMADS has been so few over the past 12 months or so.

This matter has also puzzled the Publications Committee. One of the reasons was thought to be the rather long lead time before publication, usually at least 6 weeks.

With the new production methods in use as from this issue of the magazine, the lead time for HAMADS has now dropped to an incredible 2 weeks....yes, 2 weeks!!....from the time the HAMAD is received at the Executive Office to the time Amateur Radio is delivered to Australia Post for delivery.

Do you think that will encourage more members to use HAMADS? I certainly hope so, but guess that only time will tell.

Incidentally, I'll bet you were surprised when you saw the 60 plus HAMADS in this issue (which I know you scrutinized before you read this). So were we. I certainly hope that it is a sign of things to come.

By the way, the Executive Office acknowledges receipt of all HAMADS on the day that they are received in the post. If you do not receive your acknowledgement within a reasonable time, please let me know.

DELIVERY OF AMATEUR RADIO TO MEMBERS

For many years now, members have expected Amateur Radio to be delivered to their letter box on, or very close to, the 1st day of each month. One of the by-products of the new production methods which, among other things, have resulted in the substantially reduced lead times for copy, is that typesetting and printing are now tied to days of the week, and not days of the month.

One result of this is that the magazine will be delivered to the mailing house, Polk Mailing Company Pty. Ltd., on the last Friday of each month. Depending on the vagaries of Australia Post, members should then receive their magazine sometime during the following week.

Therefore, before contacting the Executive Office about non-receipt of your Amateur Radio, please check the date of the last Friday of the previous month, and work from there.

NEW COLUMNS

The Publications Committee is currently considering whether we should be introducing some new columns into the magazine. However, with the reduced content in the new look magazine, brought about because of the much demanded increase in print size, it may be difficult to fit in additional columns on a monthly basis. One option may be that some of the columns appear on a 2 monthly alternating basis.

It is suggested that one new column could deal with arguably the most exciting, rapid growth area of amateur radio today, packet radio. Another could deal with the use of computers in amateur radio today (ATV, SSTV, CW, AMTOR, logkeeping, etc.). And yet another column could deal exclusively with antennas, an area of our hobby which intrigues and involves us all.

What do you think? Are there any members who have the necessary skills to write such columns for the magazine? If so, please let me hear from you.

CONTRIBUTIONS ON DISK

Whether you are a regular columnist, or an occasional author, we would be pleased to receive your manuscript on a floppy disk. The only limitations at present are that the disk must be a 5 1/4 inch disk in IBM format. The Executive Office can deal with all of the major word processors. However, if in doubt, an ASCII dump will probably be quite adequate.

EMTRONICS 1989 ELECTRONICS & COMMUNICATIONS CATALOGUE

Several members, having noticed that the excellent 1989 Catalogue issued by Emtronics (a major advertiser and long time supporter of Amateur Radio) was included as a supplement in a couple of other magazines, queried why the Catalogue did not appear as a supplement to our magazine.

I can assure members that it was not for the want of trying. Over the period of a few days from the time we were first approached by Emtronics, all of the production problems involved with the inclusion of such a large "insert" into Amateur Radio were resolved, and a mutually satisfactory price was agreed between Emtronics and the WIA.

Then the fun started. As members know, Amateur Radio is distributed entirely by post, and is mailed as a Category B item which attracts a substantial concession in postage costs. However, one of the Category B rules states that the insert or supplement to such a magazine cannot be of a greater size or mass than the magazine itself. Emtronics Catalogue is the same size, and the same number of pages as Amateur Radio but, because of a higher quality paper, its mass is greater. No amount of pleading, argument and cajoling was successful in getting APO to change their ruling.

If we had proceeded with the inclusion of the Catalogue in the magazine, we would have lost the Category B classification, and incurred a blowout in the postage costs of several thousand dollars.

Emtronics and the WIA had a number of discussions, attempting to find a viable alternative method of providing the Catalogue to members, but to no avail.

1988 AUSTRALIAN BICENTENNIAL RADIO AMATEUR CALLBOOK

What a saga this turned out to be. We wrestled for months with the problems associated with the listing of callsigns and addresses supplied to us by DOTC, in an effort to minimise

the high error rate. The staff of DOTC in Canberra were most co-operative, and we eventually thought that we had corrected most of the more obvious errors, despite delaying quite considerably the schedule for printing.

Then the gremlins got to work with a vengeance.

At least, we felt, the WIA members details would be correct because they came from our own database. But then, as you know, due to a computer malfunction which was not discovered until the Call Book was printed and on sale, two page blocks of callsigns were omitted, hence the insert in December issue of the magazine. (Incidentally, if you did not receive this insert, please let me know, and I will forward one to you immediately.)

As one tends to expect from computer malfunctions, it wasn't very fussy about who was left out. For example, the missing callsigns not only included the editor of Amateur Radio Action magazine, Chris Edmondson, VK3YID, but also the President of the WIA, Peter Gamble, VK3YRP.

The 1988 Call Book was also to include the DXCC listing, Australian repeaters, and the Australian band plans. They didn't make it, and thereby added to the list of problems.

Despite all the difficulties, however, the Call Book is selling quickly, and there are not many copies left.

The next Call Book, to be published later this year, can only be better.

WITHDRAWAL OF 576 - 585 MHz AMATEUR BAND

This band is allocated on a primary basis to the broadcasting service, and on a secondary basis to the fixed and mobile services. A footnote to the Australian Frequency Allocation Table (AUS 30) allows amateur use of this band until such time as it is required for use by the Broadcasting Service.

Some years ago the WIA sought assurances on the continued use of the band. At that time a limited assurance was given for 3 years. That time has now expired. During the WIA/DOTC Joint Meeting in Canberra on November 22nd and 23rd, 1988, the WIA representatives were advised that, as a result of the Federal Government's television equalisation scheme which has placed considerable pressure on the limited amount of UHF spectrum available for broadcasting purposes, the 576 - 585 MHz band was to be resumed in the near future. Negotiations were entered into, exploring a number of options, including the possibility of using an "adjacent" channel to the 576 MHz band. (DOTC have subsequently advised that there is no such spectrum space available on an Australia wide basis.)

In a letter dated 24th December 1988, DOTC have officially notified us that they are going to withdraw the use of the 576 - 585 MHz band by the amateur service as from 1st March 1989.

At first it seems that the long drawn-out inevitable has finally happened. No more 576 MHz operation. No more 576 MHz ATV.

But all is not lost.

DOTC have agreed to one of the WIA proposals and advise that "Existing Amateur television repeater stations allocated in the affected band will be permitted to continue to operate until the frequency band is required for the respective area. However, no applications for new Amateur Television repeaters will be accepted for the band 576 - 585 MHz."

The letter from DOTC goes on to say "...as Amateurs may receive on any band, in the short term there will be no significant disadvantage to ATV operators. This approach will also allow each repeater licence to be reviewed on a case by case basis as a Broadcasting Service moves into the area."

Obviously, it will now be necessary for any groups proposing a new ATV repeater to opt for either an "in-band" 70 cm repeater, or a repeater output on 23 cm. This latter band has proved popular in the UK and the USA where the technology required has been amply demonstrated.

AMATEUR LICENCE EXAMINATION DEVOLVEMENT

Early in 1988, the Department of Transport and Communications (DOTC), conducted a number of public forums on the devolution of Amateur operator certificate examinations. At that time DOTC announced that it planned to commence the new procedure in the latter half of 1988 and called for submissions from clubs and educational bodies interested in participating. In response to that request, a large number of submissions were received by DOTC. However, nothing has been heard from DOTC since that time.

As a result of the matter being raised at the recent WIA/DOTC Joint Meeting, DOTC now advise that, largely due to problems in the filling of positions within the Department in the examinations area, they have not been in a position to implement the new procedure, or to advise applicants of the precise details of the accreditation process.

DOTC further advise that, while the majority of the work has been completed, some refinement of the examination question banks, and other administrative arrangements, is still required. However, although DOTC state that they will be implementing the new procedure at the earliest opportunity, they also include the proviso that the final implementation will be dependent on resource availability to complete the outstanding tasks, and to process applications.

50 MHz BAND

Currently, as members are aware, there are a number of restrictions on the use of the 50.0 to 52.0 MHz section of this band by radio amateurs. During the transmitting hours of Channel 0 television stations, radio amateurs in VK1, 2, 3, & 4 cannot legally use that portion of 6 metres; VK5, 7 & 8 radio amateurs can operate with a power limitation of 25 watts; and VK6 radio amateurs can operate without restriction.

Concern has been expressed by the DOTC in a recent letter to the WIA about the number of radio amateurs who have been operating in this portion of the 6 metre band illegally.

The WIA is currently negotiating with DOTC with a view to achieving a set of operating conditions for the 50 MHz band which will be acceptable to all Australian radio amateurs. Continual illegal operation in this band may well prejudice our negotiations.

The WIA has been seeking advice from a number of prominent 6 metre operators to ensure that our proposals to DOTC are truly representative of the considered views of a majority of the users of this band. The submission is expected to be presented to DOTC by the beginning of February, and I should be able to inform you next month of the details of the WIA proposals.

AMATEUR RADIO MAGAZINE & WIA MEMBERS SURVEY

A significant number of members completed and returned the Survey form included with the October issue of Amateur Radio. The task of collating the information is proving to be even bigger than was originally estimated. At this stage, only about 2/3rds of the Surveys have been punched into the computer, and it may be a month or two yet before we will be able to provide complete results and analysis.

Many members sent in additional detailed comments and suggestions attached to their Surveys. All of these letters are

being read and note is being taken of their comments. As was expected, many of the suggestions and criticisms are most interesting and should be useful.

If you sent in an additional letter with your Survey, and have not yet received a reply, please be patient. The Executive Office is currently receiving an average of over 100 letters a day, many of which require a response. This "normal" mail is replied to within 24 hours of receipt but, because of the work pressure over the past few months with the Call Book, the Survey, the main subscription run (6000 members were due to renew their annual membership subscription as at 31st December 1988), and the changed production procedures with Amateur Radio, the replies to the Survey letters have had to be put aside for the time being.

The draw for the winners of the Survey gifts was held on 22nd November 1988 under the auspices of Mrs. D. Cumpstey of the Australian Electoral Commission. The winner of the Alinco ALX-2T 2 metre FM handheld transceiver was Barry White, VK2AAB. Winners of the 1989 ARRL Handbooks (which are still on their way to us from ARRL) were Mr. R. L. Carden, VK4XRL; Mrs. B. D. Hebiton, VK6DE; Mr. R. J. Richards, VK2ZGI; Mr. P. N. N. Wong, VK3VNN; and Mr. R. L. Osmond, VK5AOR. Congratulations!

MEMBERSHIP SUBSCRIPTION NOTICES

As was announced a few months ago, some commercial changes were made to membership renewal procedures. No longer do we send out the second reminder notice. Also, people who do not renew, now only receive one issue of Amateur Radio after their subscription expires.

The non-receipt of the magazine is turning out to be the best reminder notice we could use!

In an endeavour to make it clear to members that the first subscription reminder notice was to be the only notice forwarded, it was decided to place a warning to this effect on the notice itself. Therefore, in accordance with standard commercial practice, all notices forwarded out since the beginning of October had the notation "FIRST/FINAL NOTICE" printed on them.

This has upset several members, who felt that this notation was rather arrogant and demanding, reminiscent of a final demand from a finance company. The WIA is now a customer driven organisation, no longer a systems driven organisation. We have listened to this critical feedback, and acted.

All subscription reminder notices from now on will bear the notation "FIRST/ONLY NOTICE". I am sure those of you who were offended by the original notation will be pleased to observe the change.

ASSISTANT GENERAL MANAGER

After several months of analysis of the Executive Office workload, and clarification and determination of job specifications, it was decided to create the position of Assistant General Manager.

After having determined the desirable criteria, the headhunting began. After several weeks of approaching people, interviews and discussions, I am pleased to announce the appointment of Ross Burstal, VK3CRB, to the position of Assistant General Manager, at a salary of $23,920.00 per annum.

Ross is an active amateur, has just taken early retirement from a senior banking position, and is familiar with the workings of the WIA, having served as the Federal Treasurer for a number of years.

The Executive, and the Executive Office staff, consider themselves fortunate to have gained the services of a person with the skills, ability, knowledge and experience that Ross has, and I am sure all members wish Ross well in the challenging task which he has already commenced.

NON-RENEWAL OF MEMBERSHIP WITH THE WIA

Each year about 400 - 500 members of the WIA do not renew their membership. Although these non-renewals are compensated for by new recruits, it was decided back in August 1988 to write to all those people who had allowed their membership to lapse in the 5 month period from the 1st January to the 31st May 1988.

In all, 438 letters were sent out. In those letters we asked people what was the reason for their non-renewal. Was it a conscious decision, or an oversight? Was it because of something that the WIA did wrong, or did not do at all? Was it financial?

And as an incentive to renew, we offered the chance of a free membership for a year to those who renewed before a certain date.

The response was most interesting. Quite a number of people renewed their membership. And quite a number wrote advising of the reasons for their non-renewal.

This feedback has given us quite a bit of food for thought and we are continuing the analysis of these comments and suggestions, and taking them into consideration as we review our procedures and plan future policies.

Of those people who elected to renew their membership as a result of the letter, we are pleased to announce that the lucky winner of the refund of his renewal subscription is VK7ZLA in Ravenswood, Tasmania. Congratulations!

FEDERAL INTRUDER WATCH CO-ORDINATOR

This vital, but often frustrating and thankless task, has been performed professionally and competently by Bill Martin, VK2COP, for many years. Early in 1988 Bill advised that he would be resigning from the position as from 31st December 1988, and the hunt was on for someone to step into Bill's shoes, a very difficult task indeed.

However, at the same time as the WIA and its members say a very sincere thank you to Bill for all his hard work over the years and for a difficult job very well done, I am pleased to announce the appointment of another Bill, this time Bill Horner, VK4MWZ, to the position of Federal Intruder Watch Co-ordinator. I am sure Bill Horner can count on members' support in the time consuming and potentially frustrating job ahead of him.

APPOINTMENT OF WIA CERTIFICATION MANAGER FOR ARRL WAS AWARD

As most HF operators know, one of the most popular awards in amateur radio is the Worked All States (WAS) award offered by the American Radio Relay League (ARRL). Up until now, Australian radio amateurs seeking this award have had to send their package of QSL cards to the ARRL in the USA in order to apply for the award certificate.

All this has changed now with the appointment by the ARRL of the WIA Federal Awards Manager, Ken Gott, VK3AJU, as their Australian certifying manager. If you want to claim this ARRL award, simply follow the usual application procedures, but send your application and QSL cards to Ken.

Ken has also been appointed as the Australian certifying

manager for the ARRL VHF/UHF Century Club award, but I don't think Ken is going to be rushed with applicants for this particular award.

JOTA 1988

A recent letter from June Retallack, National JOTA Liaison officer for the Girl Guides Association of Australia, states that the Girl Guides Association would like to thank all radio amateurs throughout Australia for their untiring help during JOTA 1988. June goes on to say "Each state expressed their sincere appreciation for the wonderful time the Guides and Scouts had and the patience the operators had with them. Thank you very much."

AMATEUR RADIO 75TH ANNIVERSARY FIRST DAY COVERS

During a recent clean up of the Executive Office, a box of 360 of these first day cover envelopes was found. They each have a 33 cent stamp imprinted on them, and are currently selling in stamp collecting shops for upwards of 50 cents each.

If you would like to obtain some of these collectors items, we will post a bundle of 10 to you on receipt of your remittance of $4.50. I expect these will be very popular, and it has been decided to limit the supply to one bundle of 10 to a member. Simply post your cheque or credit card details to the Executive Office at P.O. Box 300, Caulfield South, Vic., 3162.

DIVISIONAL NEWS BROADCASTS

The dissemination of news to the members of the WIA is quite a task. The pages of Amateur Radio provide a very good vehicle to let members know what is happening, but the WIA has not really used this medium to advantage in recent times. Perhaps the long lead times were partly responsible for this. Often the news was stale by the time members received the magazine.

With the lead time now reduced to about 2 weeks for stop press items, we should be able to reverse this situation. From this issue onwards, the Executive Office staff will do their best to let you, the member, know what is going on in the Federal scene of your organisation, the WIA. Let me know if you are not happy with what we are doing.

Another very important medium for keeping members abreast of WIA and amateur radio news, is the Divisions' Sunday news broadcasts. These are very competently produced and presented, and provide you with an opportunity to catch up with some local news that is not included in Amateur Radio.

Also, as most Divisions' news broadcast transmissions can be heard in most other Divisions, on one frequency or another, if you miss out on your local broadcast, you can often catch up with the Federal news on another Division's broadcast, and learn a little of what goes on in that Division at the same time.

The WIA Directory, on an earlier page of this magazine, will tell you the frequencies and times of the Divisional news broadcasts, and lots of other information about Divisions as well. It is expected that this WIA Directory will appear in all future issues of Amateur Radio.

1989 FEDERAL CONVENTION

It is now over nine months since the 1988 Federal Convention of the WIA, the 1988 business year of the WIA has finished, and your Executive and the Divisions are in the throes of forward planning for the 1989 Convention. This will be held at the Brighton Savoy Hotel in Melbourne from Saturday 22nd April to Tuesday 25th April, 1989.

The theme for the 1989 Convention is "Planning for the Future", with a minimum of review of what has been done in the past which cannot be altered.

Naturally, the usual reports and agenda items from Executive, Divisions, and Co-ordinators will need to be received at the Executive office in sufficient time to be distributed to all Divisions prior to the Convention. Under the Articles of Association of the WIA, the closing date for receipt of these items is 22nd March 1989.

However, this year we are asking all people concerned to make the effort to ensure that all reports and agenda items reach the Executive Office 7 days earlier than that date, so that they can be published in the April 1989 issue of Amateur Radio magazine.

Therefore, if everybody co-operates, all members should have the opportunity this year to be aware of what is to be discussed at the Convention several weeks beforehand.

If you have a matter or proposal that you believe should be raised at this Annual General Meeting of the WIA, you still have time to approach your Divisional Council.

Bill Roper, VK3ARZ,
General Manager &
Secretary
ar

DX NEWS

Stop press

SPRATLY ISLANDS

There is a possibility that there will be a very short (40 hours) operation from the Spratly Islands in the South China Sea. Tentative date is on the 29 and 30 Jan 1989. The operators will be UL 7 PAE and UL 7 PCZ. At this stage we do not know the call-sign.

VIETNAM

A new DX expedition will visit Vietnam shortly. This time the expedition is organized by a US group.

The date is from the 30 Jan 1989 to the 22nd Feb 1989. The usual WARC bands will be worked both on SSB and CW. The provisional call sign is 3WØA.

Contributed by Steve Pall
VK2PS.

WICEN

Melbourne-Sydney Bicentennial Bike Ride

The Caltex Bicentennial Bike Ride saw 2,200 cyclists and 400 officials and support crew travel over 1,000 kilometres from Melbourne, through Victoria's eastern Gippsland district, Canberra and Sydney.

The riders ranged in age from 5 to 72 years. Two men, one who could only walk with the aid of sticks and another with two artificial hands, both proudly finished the ride.

About a quarter of the riders came from the United States. Many of those tourists here for Australia's 200th birthday flew Canadian flags on their bikes to disassociate themselves from some fellow country folks who continually complained about the weather, the food , and you name it. It appears many visitors brought light weather clothing for "Australia's hot summer", but got drenched to the skin! The ride which began on November 26 and ended December 10, was exceedingly wet for the first three days and the last two.

One rider suffered a broken hip, another a fractured collarbone, and two others concussion. They were quickly attended to by St John first aid units on the ride.

The exercise from WICEN point of view was to provide safety and emergency communications along the route. Most days WICEN control handled about 500 messages through HF, VHF, and UHF CB.

Total WICEN operators were 53, including 19 from VK1 which took over the exercise once the ride reached Bombala.

The ride started out on November 26 with heavy rain and by the time it reached Rosedale in Victoria's east on day 2 the camping ground chosen for an overnight stop was flooded.

The local council activated the State Disaster Plan and the local SES and Red Cross found alternative accommodation in the district. This was the first time the disaster plan had been implemented for a recreational activity.

WICEN Victoria has covered bike rides for 5 years, so knew what to expect from experience and came well equipped and prepared. There was an obvious difference in operating techniques between the Victorian and NSW WICEN groups. Victoria seems to be more experienced in long-distance based activites such as bike rides, canoe marathons and car rallies. It appeared WICEN NSW were more used to providing communications via hand held radios within a relatively confined area. The WICEN ACT members commented on the efficiency, sharpness and friendly style of their colleagues from Victoria.

The first-timers who joined WICEN Victoria for the ride had their eyes opened to the professional manner in which the organisation performs. They learnt something and readily offered their congratulations on the efficiency of WICEN's operation.

Those listening on repeaters along the route also offered their compliments to WICEN control, and on occasion provided a relay or monitored the channel during times of communications difficulties.

This is heartening and shows a willingness by many radio amateurs to do their bit when needed — and they will be in time of disaster. **ar**

FORWARD BIAS

Monthly Meetings

The October meeting saw a presentation by Duncan, VK2XMI, on the Molonglo Terrestrial Radio Telescope (also known as the Molonglo Observatory Synthesis Telescope - MOST).

The telescope which belongs to Sydney University is situated near Captains Flat in NSW. Duncan, with a small team of three helpers runs the telescope on a budget of $150K (eat yer heart out NASA).

The station operates 365 days per year and last year recorded 345 successful observations. Not a bad record for an operation on a shoestring budget. Each observation takes 12 hours to complete.

The primary targets of the telescope are:

Supernova
Active Flare Stars
Quasars
Pulsars
Extended Extra Galactic Objects
Irregular Transient Effects

The telescope is based on the rotation synthesis principle which relies on the Earth rotation to provide scanning on one axis. It consists of two parabolic troughs each 778 m long. Within the troughs are 7 800 individual ring dipoles. The reflector is 12.5 X 25.5 mm galvanised wire mesh. The troughs are tilted in a N/S plane to provide the other scanning axis. The physical and electrical apertures are 18 000 and 10 000 sq metres respectively.

The frequency of operation is 843 MHz, and as one wit said "you don't have to have HF to work DX!">

Duncan took us though the mechanicals and the electronic make-up of the telescope. The talk included some hard copies of observations taken by the station. The presentation can best be summed up in the words of our erstwhile President "the mind boggles!".

Duncan is happy to arrange for groups to visit the actual station. Any such visits should be arranged through the VK1 Committee. This offer extends to groups outside VK1, but again please arrange them through the Committee.

The November meeting was largely an end of year social activity. There was a short presentation by Ian, VK1IC, complete with slides of some of his underwater dives. Many of us were surprised to find that many species of coral grew along the South coast of NSW. You learn something every day.

Future Meetings

February is our Annual General Meeting and election of office bearers. Your attendance is vital to ensure we choose the best possible committee.

Some members may actually want to serve on the committee, but are either too shy to put their names forward, are worried about the workload or concerned that they may not have sufficient skills or experience. If you fall into this category have a quiet word with one of the existing committee members and maybe those fears may disappear.

The March meeting will include discus-

sion on possible items for inclusion in the Federal Convention.

Meeting dates for 1989 are :

February 23
March 27
April 17
May 22
June 26
July 24
August 28
September 25
October 23
November 27

John Moyle Field Day 1989

It is planned to operate the John Moyle Field Day Station VK1WI, at Bull's Head in the Brindabellas.

Planned frequencies are DC to microwaves (whatever they are?). A special award for contacts with radio clubs is planned.Operators expressing interest so far include: VK1GB, VK1WX, VK1KEN, VK1KRM and VK1GN. If you are interested please contact me, Norm, VK1GN on 54 8512 at home.

QSL Bureau

A further reminder to make life a bit easier for our volunteer bureau operators. Please make sure that you sort your cards into call areas before depositing them with the bureau. In addition, the call sign of the destination area should be written on the top right hand corner of the back of the card.

VK1 cards go to the inwards bureau, not outwards.

VK1 Technical Workshop

The Division is still running Technical Workships each month. The Workshops aim to expose all amateurs who have the slightest technical interest to a wide range of varied hands-on activities and in so doing to raise the general level of technical competence within the Division. It's not just aimed at those who already have the skills but to all amateurs who aspire to get more out of this hobby. The main emphasis is on explaining the basics of various RF techniques, modes, measurements, construction and equipment.

The Workshop is held on the second Monday of each month in Room 3 of the Griffin Centre (Upstairs) at 7:30 for an 8:00 pm start. Contact Neil VK1KNP (062) 644654-W (062) 543 225-H or listen to the VK1 divisional broadcast for future details.

Packet Activities

The ACT Packet Group normally meets on the first Thursday of each month, but this is subject to variation. Details of venues and dates are beaconed on VHF by Richard, VK1UE, about one week before a meeting.

Details on the ACT Packet Group activities can be obtained from Carl VK1KCM on telephone 062 897819 (work) or 062 583921 (home).

VK1 Awards net

The VK1 Awards net is run every Sunday night immediately after the Divisional broadcast (2000 local time) on 3.570 MHz. The net controller and awards manager for this activity is Bob VK1DE.

Alan Hawes - VK1WX

As most of you know (if you listen to the broadcast) Alan will not be standing as President this year. In announcing his intentions, Alan muttered something about the size of the swamp, the number of alligators residing in it, and certain attributes of the swampee.

Alan has served as President of the VK1 Division for several years during a time when amateur radio was, and is, passing through a difficult period of soul-searching and external pressure.

Alan has laboured hard and long on our behalf, often at personal expense, and with little reward other than the knowledge of a job well done.

Well done Alan Hawes - may the deity who hands out good DX smile favourably on you. ar

POUNDING BRASS

Audio Filter

Gilbert Griffith VK3CQ
7 Church St, Bright, Vic 3741

As I write this month. Bright is filling up with tourists (called turkeys by the locals) and tomorrow I am due back at work after only two extra days off. December has been hectic with many letters and requests for circuits. If I have missed a letter you have sent, apologies, and please try again, with a stamped address envelope please. A lot of my answers are of circuit details previously available in Pounding Brass columns or in the ARRL handbook or other publications that are usually and should be, a part of every shack's appointments so you might save time looking there first.

For those Morsiacs who like to muck around with boards and bits, Gary Bold, author of "The Morseman" column in Break-In featured the following circuit for an active audio filter in his November column.

..."Figure 1 shows the op-amp circuit almost invariably used Technically this is an 'IGMF' (infinite gain multiple feedback) network with a bandpass voltage transfer characteristic. That is, the gain is low at both low and high frequencies, and maximum at some centre frequency fo. If R2 is greater than about 10 times R, its response is exactly like that of a tuned circuit having the values of fo and Q shown below the schematic, and a gain of 1 at the resonant frequency fo. My filter has C=22

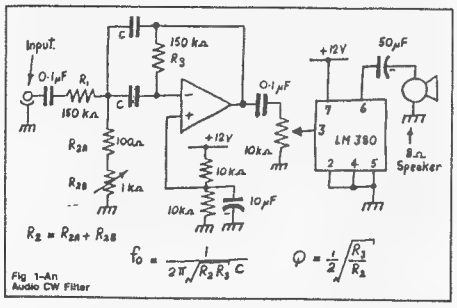

Fig 1–An Audio CW Filter

nF, and R2b (the preset pot) adjusts both fo and Q. If R2 is about 550 ohms then fo is about 800 Hz and Q is about 8. I actually use TWO such identical op-amp stages in series; only one of which is shown for simplicity. The biasing network connected to the "+" (non-inverting) op-amp input sets the quiescent voltage to half the supply voltage. The other stage also has its "+" input connected here. I feed the first stage from the headphone jack of the TS520S, so that when I plug it in the receiver audio mutes and only the filter sounds. The overall 3 dB bandwidth of this two stage combination is about 64Hz, which I find excellent up to about 35 WPM. The filter drives an LM380, in the 8 pin DIP (there's also a 14

pin DIP). This admirable audio power amplifier chip, here connected in its simplest configuration, will easily drive either phones or a speaker. I use it as a standard output stage for all sorts of things. The chip give 34 dB of audio gain, hence the gain control potentiometer at the input. The output is short-circuit protected.

Many thanks to Gary for this circuit as I know I will be building one ASAP. My passive filter is OK in conjunction with the narrow IF filters in my main rig but not good enough when used with my homebrew gear, and this sounds like a nice project.

Something for which I do not have a circuit, and none of my books could help me with, was described to me by Jim VK4HZ in his recent letter. Jim wore a hearing aid and was having problems with reflected sound in various rooms. He found that the hearing aids had acoustic coils in them and fitted a few rooms with 3 wire loops around the outside. He now can listen to the rig or TV etc. (depending which is connected) anywhere in the house. A similar set-up was used in the local school for typing lessons via headphones, and I remember their use in my own Morse exam as when I concentrated I tilted my head and found that the sound faded as the headphones changed their angle to the field. Can anyone give me details as to how this set-up works? I am sure there are many amateurs who would be interested. I know that my headphone lead picks the most inconvenient moments to get in the way.

Thanks to Jim VK3AZT who sent the following.

From "Over the Top" Official Journal of the Ringwood RSL Sept 1988.

Bill

Bill was a lineman in the then PMG
When lines were lines like they ought to be
This story will tell you what he had to risk
When out on a job there's a fault he must fix

He'll remember that Saturday when he was called out
To fix up a fault on the old Merbein route
He collected his mate and his ladder and pliers
And drove along slowly, one eye on the wires

Well they spotted the fault and offloaded their roll
And set up the ladder to climb up the pole
Our Bill went up nimbly with hardly a stop
Then climbed up the arms to the one at the top

On top was a wire of galvanised iron
They say its been there since the beginning of time
Back before telex and that modern stuff
The original line for the morse telegraph.

Bill looked just the part, like a king of the sports
In nothing but safety belt, boots and his shorts
But the shorts he had on were those old fashioned kind
With the wide open legs and baggy behind

Then as Bill swung up over to get a bit higher
What was up his shorts came down on that wire
Poor Bill sat there yelling, his eyes gave out flashes
In time with the rhythm of the dots and the dashes

His mate on the ground who was footing the ladder
Was laughing so madly he near burst his bladder
He yelled up to Bill "What a thrill so sublime
On Saturday arvo and on overtime

When I saw your eyes flashing and your voice pulsing hoarse
I grabbed out my pencil and decoded the morse
Though my code's a bit rusty I saw your eyes spell
Best honeymoon wishes and hope all goes well".

Max Tulloch
Houldsworth Rd
Eaglehawk 3556

There has been a recent search for the code for the exclamation mark (!). The Morseman for October 1988 gives it as 'KW'.

However, another source I received in the mail (from whom I cannot recall because it was on a separate sheet from the letter) gives the ! as dah dah dah dit (- - - .) which seems more appropriate as this code is often used as a small laugh as distinct from HI. The same source gives the American code for ampersand (&) as. . . . hence ES for "and".

Thanks for listening, and many thanks for your letters, see you next month.

Gil, VK3CQ ar

SPOTLIGHT ON SWLing

Jammers desist

Robin L Harwood, VK7RH
52 Connaught Crescent,
West Launceston, 7250

Early in December of last year, a significant change to shortwave listeners was noticed, when the estimated 2,500 jamming senders through the Soviet Union and Eastern Europe were suddenly turned off. The effect has been very dramatic, with both broadcasters and listeners adapting to the absence of electronic pollution from these jammers on HF.

Recent political changes within the USSR with a greater openness in the media and society, known as "Glasnost" have led to a more tolerant climate. Yet what made the decision imperative, was the huge economic cost in maintaining the 2,500 senders exclusively devoted to jamming western and clandestine broadcasters in Russian and other local languages of the Soviet bloc. There were periods when jamming subsided, but not a complete absence of deliberate interference, particularly with the Radio Free Europe/Radio Liberty operation.

Initially, only two language services were still experiencing jamming, after the lifting and these were the Czech and Bulgarian services of RFE, but these were free of interference by mid-December. The result of this welcome action has been that some low powered signals long blocked by the jammers have become audible. There is less congestion on the bands also. Some of the oldtimers used to rely on the jammers as markers, particularly on uncalibrated receivers, but today's receivers have good readout, either digitally or analogue.Although some significant jamming has ceased, it is well to remember that a marked deterioration in either the domestic or international situation could conceivably see them re-appear. Jamming of broadcasts still continues, particularly in the Peoples' Republic of China, for broadcasts to the Mainland from Taiwan are constantly jammed, eg the white noise on 7.15 MHz in the evening hours. Iraq also jams various broadcasts in Arabic, especially from Iran. Their jammer sounds like an ambulance klaxon.

Just a few days after the jammers were turned off, a massive earthquake hit Armenia, with a huge death toll in the tens of thousands. Initially, the World Service of Radio Moscow was slow to appreciate the magnitude of the disaster, compared with Soviet domestic print and electronic media. Their initial reports were pessimistic, and the international media relied on their reports until foreign reporters and observers arrived in Armenia, and found the reports to be true.

The communications infra-structure within the affected region was completed destroyed and military communication

facilities had to be airlifted into Armenia. Even they became overloaded and amateur radio links had to be pressed into service to ease the congestion. A Packet Radio link between Yerevan and Moscow was established. Queries from Armenians abroad, particularly in the USA saw a teleport between San Francisco and Moscow stretched to the limit handling health and welfare and other relief traffic from Stateside hams and the affected areas. The Soviet end had difficulty tracking down individuals because of the chaotic nature of the quake.

The World Service of Radio Moscow started broadcasting in Russian as from the first of January. To Australia, there are releases between 0200 and 0500 UTC as well as 1000 to 12 UTC in the 13, 16, 19, 22 and 25 metre broadcasting allocations, probably on existing World service frequencies to this area. This is in addition to the other Russian language stations such as "Radio Rodina - Voice of the Homeland" as well as relays of the domestic "Mayak", programme.

Fewer international broadcasters are taking advantage of the increased sunspots, especially on the 11 metre broadcasting allocation. In fact, several stations that were using the band as an experimental service, have dropped them. Radio Norway, Radio Denmark and Radio Abu Dhabi have put in very good signals on 11 metres recently, yet all have ceased using them. Now there is only the BBC World Service and Radio France International left. Deutsche Welle in Cologne recently told one of their Australian monitors that they had no plans to use 25 MHz as only sophisticated models possessed by DXers were capable of receiving them. The vast majority of their audience use portable, cheap models which don't have 11 metre coverage. Hence they see no need. 11 metres therefore will probably become a feeder frequency and possibly be made available to Fixed and PTP services.

Well, that is all for February. Until next time, the very best of 73 and good listening! ar

ALARA

Joy Collis VK2EBX, P O Box 22, Yeoval NSW 2868

Contest a success despite setbacks

The ALARA Contest was held on 12th November, 1988, a date which unfortunately coincided with the Japanese International DX Contest, European RTTY Contest and OK DX Contest. This may have been one of the reasons for the smaller OM participation this time around.

Mavis (VK3KS) operated the Bicentennial call sign VI88WIA on phone and CW during the contest, giving anyone who had missed out on this one a chance to work it.

It was disappointing to hear no North American girls, but I understand some of them were on air, I guess I wasn't on the right band at the right time.

My "Contesting" was a bit spasmodic, unfortunately, and during the last three hours the "gremlins" struck with an untimely power cut, necessitating an early end to operations for me. I enjoyed the day, and particularly catching up with some people I don't hear very often.

Due to some confusion regarding the address of the Contest manger, the final date for receival of Contest logs was extended to 16th January, with provision being made to attempt to get mail forwarded on from the Wentworth address. (The correct address for VK3JAW, the Contest Manager, was published in November Amateur radio, ALARA column).

The late arrival of some logs may delay the publication of results, but hopefully we will have them in time for April Amateur Radio.

Mavis Stafford Bicentennial Trophy

All logs for the Mavis Stafford Bicentennial Trophy should by now have been received, and results will be given in this column when they come to hand.

ALARA Award Update

Cert No	Date	Name	Callsign	Sticker	Bicent sticker
142	27.09.88	Rita Judd	GOEIX	1	1
143	14.10.88	Fumi Abe	JA1AEQ	1	1
144	20.11.88	Rick Dawson	VK4NWH	2	1
Stickers					
71	19.10.88	Elva Henry	ZL1BIZ	4	1
136	19.10.88	Dawn Young	ZL2AGX	3	
48	21.10.88	Joy Collis	VK2EBX	10	1
92	2.11.88	Kim Wilson	VK3CYL	1	

We would like to extend to Valda, VK3DVT, a vote of thanks for designing and producing the attractive Bicentennial stickers issued during 1988.

Bits and Pieces

With improving propagation it has been good to work YLs from several "medium rare" DX locations, including Iris Colvin ZC4ZR (Cyprus), Meralda VR6MW (Pitcairn Island) and Robyn VKOAE (Macquarie Island,) to name just a few.

We were saddened to hear that Marjorie VK3HQ, an amateur for 56 years, and early member of ALARA, became a silent key on 9th December.

ALARA played a major role in the operation of the Bicentennial callsign VI88WIA, with a total of 3,230 contacts logged. Other bicentennial callsigns used by ALARA at times throughout the year included VI88VIC, VI88QLD, VI88WA and VI88SA.

Information has been received from Christine GM4YMM regarding a new YL net which has commenced on 14.246 MHz.

The net begins Thursdays at 1700 UTC, which is unlikely to prove a popular time for VK YLs, except very early risers and those suffering from insomnia!

That's about it for this time. 73/33 ar

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5/8 WAVE

Picnic frolic

Jennifer Warrington VK5ANW
59 Albert Street
Clarence Gardens 5039

They say a picture is worth a thousand words, so I'll leave it to the pictures to do most of the talking this time! They were taken by Janet Bulling VK5NEI at the WIA (VK5 Div) Picnic on November 20th, 1988. I think they show that a good time (and lots of donuts!) was/were had by all, despite the very inclement weather. Thanks Janet for these photos which will now go into the archives for posterity!

I am pleased to be able to tell you that I have had a second photograph of a Past President donated. Phil Williams VK5NN has give me one of himself taken at about the time that he was President. The photograph is a small one but that won't matter, we can easily have it enlarged. Thanks Phil, and anyone else who only has a small photograph that he didn't think was suitable, we would still be grateful to receive it (or even to get it copied and then hand it back).

Diary Dates

Tues 28th February

Video on crystal grinding by Clem Tilbrook VK5GL

ar

Steve VK5AIM & Sue VK5XYL

WIA Picnic, Donut eating contest, 1988. L to R: Barry VK5KCX, Steve VK5AIM, Arno VK5ZAR

VK5 Div president, Don Mc Donald VK5ADD.

HOW'S DX

Vietnam, Mellish, temporarily active

Some Australian Amateurs were pleased to find Vietnam 'XV' on the air for a limited period.

Vietnam was activated by a Hungarian group of amateurs who travelled to Vietnam without any sponsorship at their own costs in the middle of October, 1988.

The group: HA5MY, HA5WA and HA5PP activated Vietnam under two special call signs. 3W8DX for SSB contacts and 3W8CW for CW contacts.

They were active on the 28, 21, 14, 7 and 3.5 MHz bands.

Direct QSLS should be sent to the following addresses: for SSB contacts: Box 271 Vienna, Austria, Zipcode 1141.

For CW contacts to Box 131 Vienna, Austria, Zipcode 1141 with the appropriate self addressed reply envelope and IRCS or green stamps.

The group started operations on the 23rd October, 1988 and were scheduled to leave Vietnam on the 30th November, 1988.

Up to the 12th November 1988 they made 37000 QSO's. We regret that this information is far too late to work them. We did not received it until mid-November. It seems unlikely that Vietnam will again be active in the near future.

Mellish Reef DX-Expedition

A group of US, Canadian and South African amateurs finally succeeded in landing on Mellish Reef on the 8th of January 1989 and commenced operation around 0400 Z on 21.195 MHz.

The small boat carrying the expedition - VE3IEO, KG9S and ZS2KN among them, arrived near Mellish in the early hours of 7th January 1989. Because of strong wind and rough seas, they had to approach from the easterly direction, got into some difficulty and were forced to anchor 2km off the Reef. There were 3 metre waves on the western side.

Whilst trying to land they lost some blades of the propeller of their aluminium boat.

They landed two operators and one crew member on Mellish at the first attempt and it was 24 hours later before they were able to get closer to the Reef, land the equipment, food, water, generators, etc.

They became operational at about 0400 UTC on Sunday the 8th January 1989.

So far they have operated on 21195 and 14195 working split frequency and listening from 21200 to 21220 and 14200 to 14220 -

The call sign is : VK9ZM

QSL Manager is : NM2L

On their return they will activate Willis Island with the call sign VK9ZW.

They expected to be on the Reef about 7 days.

Contributed by Stephen Pall, VK2PS

Interesting DX QSO's on the East Coast during the months of October-November 1988. Information received from Stephen Pall VK2PS

P O Box 93

Dural NSW 2158

14 MHz

FM5DN - Leon on the French Island of Martinique. QSL to W3DJZ or direct: P O Box 1134, Fort De France, Martinique, Caribbean Zip 97249.

TK5EL - QSL to F6FNU : Antoine Baldeck, 7 Res Du Val, Ollainville F-91290 Arpajon, France.

HP2XDD - Fauzi, QSL direct to: P O Box 3010, free Zone, Colon, Panama.

6V6A - Jean Marie in Senegal, special event station in connection with World Association for children.QSL to: F6FNU, address as above.

5Z4RT - Hermann - QSL to bureau or to: H E Friedrich Sachse Box 14425 - Nairobi - Kenya.

ZL5BA - Sojo on the N Z section of the Antarctic. QSL to: KB4GID Jean Pierre Frossard, 119-4, Ashley Cir. Athens, GA 30605 USA

VP2VA - Arthur on British Virgin Islands QSL via VE3MJ. Morton J Wafson 305 Rosemary Road, Toronto, Ontario, M5P3E4, Canada.

CR5CQK - Phillip in Sintra. QSL via CT1CQK via bureau

ZS88AOO - QSL via WA3HUP Mary A Crider, 2485 Lewisberry road, York Haven, PA 17370, USA

5N9GM Giorgio in Nigeria - QSL via bureau.

3W8DX - Hungarian DX expedition in Vietnam. QSL direct to P O Box 271 Vienna, Austria Zip 1141.

KG4JO - US Base in Guantanamo Bay, Cuba, QSL direct to Guantanamo ARC, Box 73 FPO New York, 09593, USA.

SU1ER Ezzat, QSL direct to: Ezzatss Ramadan P O Box 78 Heliopolis, Cairo 11341, Egypt

YN3CC - CW QSO. Jose in Managua QSL to Box C89 Managua, Nicaragua

UG6GAT - Ken in Yerevan, Armenia. P O Box 54 Yerevan 10, Armenia, USSR

W200DW Jim - 200 Years Anniversary of the U S Constitution Special QSL. Direct to : Raleigh ARS P O BOX 17124 Raleigh, North Carolina - 27619, USA

HV3SJ - Pino in Vatican. QSL to : IODUD, Giuseppe d'Aurelio Via Antonio Fogazaro, 87 I-00137, Roma, Italia.

TA2BK, Bahri in Turkey. QSL via DJOUJ ; Bahri Kacan Schuhmacherring 31, D-8000 Muenchen 83, Western Germany.

5V7WD Dany in Togo. QSL to WB4LFM Paul E Greaves, 122 Swinton Dr. RT. 10 Greenville, South Carolina 29607 USA.

LX1WH, Henry in Luxembourg, QSL via Buro.

SV9ABG, Manuel on Crete. QSL to P O Box 133 Iraklion - Crete, - 71110 - Greece.

FOOBEF/P Fabian on the Island of Ua - Huka in the French Polynesian Marquesas Archipelago. QSL via FE1JCN via Buro.

21MHz

UD6DFF - CW- Leon in Baku Azerbaijan

KP2A - US Virgin Island QSL via Buro

P40S - Aruba Island in the Caribbean. SSB contest station. QSL to : Aruba Amateur Radio Club QSL Bureau Box 273 San Nicolas, Aruba

HKONZI Canal on St Andres Island, PO Box 1019 St Andresisl Colombia - South America.

5W1GT Carol (YL) on Western Samoa QSL to N5CX; Lawrence Williams P O Box 652 San Antonio TX 78293

EA9EA - CWQSO - CQ WW CW contest QSL via bureau.

YS1MAE - Mario in El Salvador QSL via WN5K ; Paul F. Perck 41067 Highway, 931 Gonzales, LA 70737 USA

28 MHz

CP6IH - Marcelo in St Cruz. QSL via bureau
GD4PTV Brian on The Isle of Man QSL via bureau
3D2XX QSL via VK8XX
PJ1B QSL to K2SB Stephen P Branca. 202 Minnetonka Raod Hi Nella, NJ 08083 USA
HD8DZ Luis in Galapagos Islands. QSL to Luis Hidalgo. HC2DZ P O Box 777. Guayaquil, Ecuador, South America
P40V - Aruba - See address above
3W8DX - Hungarian DX-Expedition in Vietnam - See QSL address above.
CW5A - QSL via CX5AO
HB0CZS - QSL via Bureau
YJ8NJS - Box 431 Port Vila, Vanuatu
JH7EAY/PJD1 - Minami Torishima vai QSL Bureau
3W8CW - CW QSO - Hungarian DX Expedition in Vietnam QSL direct to:
P O Box 131 Vienna - Austria Zip 1141
Unless specifically marked all QSO's were in the SSB mode.
Levent, TA3F was heard with a good signal on the East Coast. QSL direct to P O Box 66 Izmir, Turkey.
YS3CB was active on SSB with a good signal strength. QSL direct to Carlos, P O Box 3733 Managua, Nicaragua.
Hassan from Iran, EP2HZ was heard working the East Coast on 14 MHz SSB. QSL direct to P O Box 16765 - 3133, Teheran, Iran.
Worked C56/F2CW, - Jackie in Gambia on SSB, 14MHz. Qsl to F2CW callbook address.
The Russian "Glasnost" creates interesting situations in the amateur world. More and more USSR DX stations are requesting QSLS direct to their private box numbers, - and in turn posting QSL cards direct and not via Box 88 Moscow.

News submitted by Steve VK2PS

Are you looking for Mozambique?

A station is operating for three days a month from the Swedish Embassy in Mozambique under the callsign C9MKT.

Already a number of Australians had worked this station on both the ANZA net and during the CQ World Wide Contest.But if you missed C9MKT listen during February 17-19 on the 21MHz band. The QSL information is via SM5KDM.

The following is a list of stations either heard or worked in November 1988, by Bob Demkiw VK2ENU

Date	Time	Band	Station	QSL Information
05-11	0840	20	CR5CQK	Special call sign commemorating 500 years of Spanish exploration in the world. QSL to Philipe, CT1CQK
	0912		LU8QK	
	0926		P29JD	P O Box 5878 Boroko, PNG
19-11	1156		BY4AA	
	1206		JA3NWO	
	1218		A35KK	SM7PKK
28-11	0530		EA7LM	
	0647		YT3LC	
	0819		F6BFH	
	0832		VK3BWX	
04-12	0652		DJ3HJ	
	0705		YU7WX	
	0755		CN8EP	Lofti, P O Box 5335, Casablanca, Morocco.
	0759		OE9BGI	
05-12	0740		CTIAYN	
	0818		GOCOS	
	0835		YB8ASX	
	0846		GW2ARP	

Conditions on this day were peculiar as propagation to various parts of the United Kingdom varied. The GOCOS station was very weak and 2X contact almost impossible. However, the GW2ARP station was heard for at least one hour from 0800 with signals of 5X9. In fact this station was used to relay information for YB8ASX whose signals were very weak and almost unreadable at this QTH.

11-12	0518		WA2EXQ	
	0719		NR3B	
	0818		F6GOC	QSL Direct
14-12	0935		ZL1AJI/QRP	

Avery ZL1AJI was an interesting but brief contact as he was running an Argonaut on a motor bike battery with an output of 2 watts into a quad antenna. Although signals were down between VK and ZL, he was heard working into Brazil and the United Kingdom. Just proves that a little power goes a long way when conditions are right.

17-12	1238	20	6Y5FHN	Box 135, Kingston 15, Jamaica
18-12	0753		ED1DX	
21-12	1024		FM5WE	
28-12	0807		VK4EAB	
	0819		IV3DXW	
	0832		G3BKG	
	0847		JI2EMF	
	0859		K200QHD	KF5PE
	2338	10	VK9NS	
29-12	0621	20	3D2HO	
			(HEARD)	G0GLJ
	0641	15	JL3WSL	
31-12	0144	20	VK3ABS	
	0652		FK8FU	

CLUB CORNER

Disabled radio Amateurs' club

Dates for 1989

General Meetings - 1st Saturday of each month, (except otherwise indicated commencing at 2.00 pm).

February	4th	
March	4th	
April	1st	
May	6th	AGM
June	3rd	
July	1st	
August	5th	
September	9th	(NWARG Field Day on Sat 2nd Sept)
October	7th	
November	4th	
December	2nd	Christmas Break Up starting at 12.00 noon.
	NB	Dates may alter according to public holidays.

Other Club Functions

Every other Saturday afternoon in each month between 2.00 pm & 5.00pm
Every Thursday evening after 7.30pm.
If members wish to use club facilities at other times please ring beforehand to gain approval at residents convenience.
NB Transmitting Equipment must only be used under supervision of respective Licenced Operator.

Field Days and Social Activities etc.

These are organized during the year as suggested at meetings
Annual Membership Fee is currently $5.00 due in May.
To cut back on phone calls and postage, keep in touch by being present at meetings and making contact with fellow members.
We have a saying.. You QSO with us and we'll QSL with you All the best and 73's for 1989. From, Kelvin J Lee, Hon Sec DRAC VK3ZZ (Sec, A/H Phone 391.6310) (MS Unit Phone 367.3000).

Orange Radio Club

The Orange and District Amateur Radio Club will be setting up a stand at the Australia National Sports and Leisure Show 10 to 12 March 1989 at the Australian National Field Day Site West of Orange on all facets of Amateur Radio.

The club is hopeful that with appropriate sponsorship that a special QSL card will be available for all contacts made over the 3 days.

The club extends a welcome to all amateurs who attend the show to call and say gi'day.

More details will be forthcoming.

EDUCATION NOTES

Emergency procedures

Federal Education Officer
Brenda Edmonds
VK3KT
PO Box 883
Frankston 3199

I have just returned from annual "holiday" as part of the WICEN team providing communications for the Murray River Canoe Marathon. Each year I return impressed by the enthusiasm and dedication shown by those who attend. There are the inevitable disagreements about interpretation of instructions or procedures, but these are minor in comparison with the value of the training and experimentation in emergency procedures.

I am reluctant to write about the importance of WICEN as a facet of the hobby, and the importance of all amateurs being prepared for emergency or disaster operation because the last time I did so, three weeks after its publication we were caught up in the Ash Wednesday disaster. I do not wish to precipitate a similar disaster this year, but again I stress that we hold a number of our privileges by virtue of our ability to assist in emergencies, and that some degree of training in this type of communication will pay off by enhancing our image in the community as well as by providing personal satisfaction when we have to cope with the unexpected.

The main trouble, of course, is that in general the need for disaster services does not occur often enough. By the time the next one comes, the lessons learnt in the previous one have been forgotten, the personnel have changed and the next generation has no time for the advice of their elders.

However the basic requirements for emergency operations do not change. They comprise an ability to foresee possible needs or hazards, a willingness to adapt to variable conditions and a knowledge of correct procedure for efficient operation. When a genuine emergency arises, amateurs, like most of the rest of the population, are quick to volunteer. Unfortunately the untrained or inexperienced can cause problems to the organisers and to the teams to which they are rostered. There is no time in a disaster for on—the—job training. We have all heard of the volunteer fire fighter who turns up at the fire in shorts and thongs and without drinking water. The amateur who volunteers without giving thought ot the adequacy of his/her) equipment, — vehicle, power supply and personal requirements as well as radios — is a similar hazard to himself and the rest of the emergency personnel. The amateur who brings to the emergency net the extended waffle, unnecessary repetition, poor audio quality or an inability to put down the mike is a threat to the whole network.

How then can the 'average' amateur acquire some training in emergency procedures?

Some self training is possible. Listen to yourself and others on air, and become aware of the amount of unnecessary verbiage that is transmitted.

Could the information contained in that three minute QSO have been sent in half the words in a quarter of the time? Is it necessary to tell the other station what he has just told you?

Does your listener have to ask for repeats because of poor audio quality or your poor diction? Once we become aware of bad habits, they can be corrected.

Field Days were originally intended as a way of practising operating under emergency conditions. As contests, they emphasise listening skills, clear speech and efficient use of on-air time as well as practice in setting up with emergency power and portable equipment.

I am not fully aware of the activities of WICEN groups in other states, but in VK3 there are numerous training exercises in conjunction with events ranging from half day 'fun runs' to the extended activities such as the Canoe Marathon and the Great Victorian Bike Ride.

As well as providing practice in message handling, these extended events provide practice in maintaining long periods of silent watch in uncomfortable conditions, which is a lot harder than many people realise.

All these, however, are artificial in that they are pre-arranged. The operator can spend weeks finding a site, preparing equipment, packing and setting up.

The only realistic practice for emergency operation is one that simulates a genuine disaster by having a call-out notice of only 1-2 hours, sends participants into unknown country, includes overnight operation and a significant weather change, has built-in equipment failure, and includes psychological pressures and minor physical injuries. In addition, it needs to involve liaison with other disaster co-ordinating groups.

It is, of course, hard to plan such an exercise, but I believe some groups are occasionally practising short notice exercises.

It is possible to make individual preparations for a sudden emergency. If the equipment is well maintained and a limited amount of portable gear available, all that is needed is to pack the vehicle.

Make a list of what might be needed and prepare the items which need to be added. One or more portable dipoles, a 2 metre ground plane and an expandable mast with guy ropes if necessary make the basis of an antenna system.

A spare car battery can run both HF and VHF transmitters for several hours. Add a basic tool kit, some ropes, writing materials and a table and chair and you have a set-up which can be adapted to most situations.

Naturally, at the time of packing, you add the personal requirements of extra or protective clothing, a hat, some form of shade and enough food and drink (non-alcoholic) to be self sufficient for at least one day. Do not go out expecting to be 'looked after' by the welfare groups.

A few 'Don'ts': - Do not assume that you will be able to operate from your vehicle at all times. Do not assume that there will always be trees suitable for suspending antennas.

Do not assume that a hand held is all that you need to take if sent to a remote site. Above all, do not become a liability to the rest of the disaster organisation by failing to realise your limitations.

I hope that all this has been a complete waste of my time and yours, in that the emergencies do not arise.

But they are inevitable at some time, and a little time devoted to planning when there is no pressure certainly beats a last minute panic.

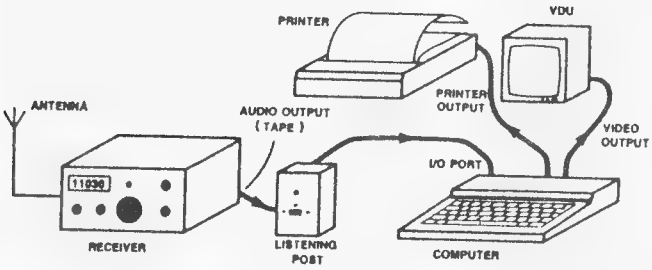
Find out when WICEN activities go on in your area, and join in some of the exercises. It can be quite good fun.

My best wishes to those sitting the February exams. Remember, READ THE QUESTIONS, and ALL the answers.

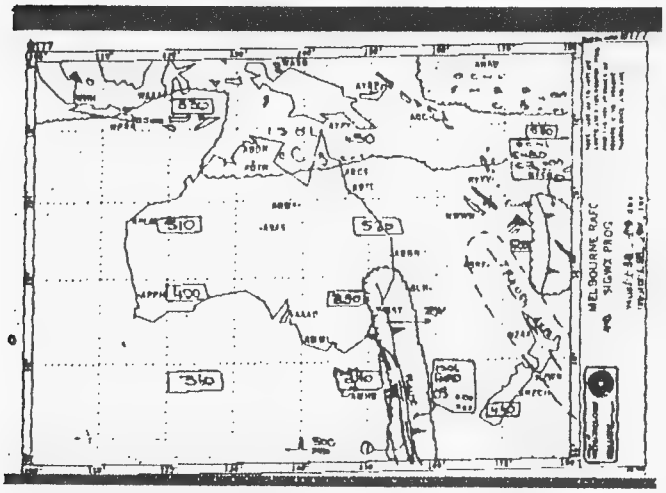
Brenda, VK3KT.

RECEIVE FAX, RTTY & MORSE ON YOUR COMPUTER

Using the Australian Electronics Monthly "Listening Post" (AEM3500) project, you can tune-in to the myriad of non-voice transmissions on shortwave and decode them! All you need is a shortwave receiver with SSB reception, the AEM3500 Listening Post, computer and software. Be the first on your block to receive weather pictures and foreign news bulletins – USEFUL and FASCINATING.



Get the Most Out of Your Receiver!



MONSIEUR LE SECRETAIRE GENERAL, DES VOTRE NOMINATION A LA HAUTE FONCTION QUE VOUS OCCUPEZ VOUS AVEZ MARQUE AVEC FORCE L'IMPORTANCE QUE VOUS ATTACHIEZ A CE QUE L'ORGANISATION RETROUVE LES PRINCIPES QUI L'AVAIENT FONDEE : ''NOUS NOUS SOMMES, DISIEZ-VOUS, SANS CONTESTE, BEAUCOUP ECARTES DE LA CHARTE CES DERNIERES ANNEES. NOUS SOMMES PERILLEUSEMENT PROCHES D'UN NOUVEL ETAT D'ANARCHIE INTERNATIONALE''. ET UN PEU PLUS LOIN VO

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1st Floor, 347 Darling Street, Balmain, NSW. 2041

CONTESTS

Contest Calendar

Federal Contest Manager
Frank C Beech VK7BC
37 Nobelius Drive
Legana Tas 7277

February

11—12	QCWA CW party.
11— 12	YLRL YL/OM SSB contest.
11—12	VERON Dutch PACC contest.
18—19	ARRL DX DW contest
24—26	CQ WW 160m SSB contest.
27—27	YLRL YL/OM CW contest.
25—26	UBA Belgian DX SSB contest (rules January AR)

March

4— 5	ARRL DX SSB contest.
11—12	RSGB Commonwealth contest.
18—19	NZART Field day contest.
18—19	WIA John Moyle Memorial National Field Day contest. (Rules this issue)
25—26	CQ WW WPX SSB contest.
18—20	BARTG Spring RTTY contest 1989 (Rules this issue)

April

12—14	YLRL DX—YL to NA—YL CW contest.
19—21	YLRL DX—YL to NA—YL SSB contest.

I have received the results of the British Amateur Radio Teleprinter Group's Spring 1988 RTTY contest and will list the Australian amateurs mentioned. In the single operator section VK5RY was the top scoring VK, he came in at number 32 with 285,360 points.

84 was	VK2BQS	with	75,432 points
90 was	VK7AE	with	56,610 points,
91 "	VK2SG	"	53,312 "
93 "	VK3EBP	"	52,032 "
99 "	VK2EG	"	44,400 "
101 "	VK1GN	"	42,100 "

I could only find one ZL station in the results, ZL2AKI with 161,436 points.

In the single operator Section the top world score was TG9VT with 1,030,160 points.

145 logs are in the single operator section, 17 in the multi operator and 13 in the SWL section.

John Moyle Memorial National Field Day contest 1989.

It became apparent after the 1988 contest that an imbalance was obvious in the overall scores and activity between the eastern Australian states and Western Australia, with respect to the New Zealand field day stations that we are encouraging you to work now that our two National field day contests coincide: This was due to the time zone and propagation differences between VK6 and ZL that enabled the eastern states to work into ZL almost continuously on the bands used by the ZL stations whilst the VK6 stations have only limited paths to ZL on 80 and 40 metres. For this reason I have loaded the scores of the VK6 stations when working into New Zealand.

Rules For The 1989 John Moyle Memorial Contest

Contest Period:

From 0100 UTC March 18th 1989 until 0800 UTC March 19th 1989.

Object of the contest:

To encourage portable operation on the amateur bands by Australian amateurs, and is intended to help amateurs become familiar with portable operations and thus assist in training them for emergency situations. Emphasis is placed on working between portable stations.

Call area definition;

A Within own call area ie, VK6 to VK6.
B Outside ones own call area ie, VK5 to ZL.

1 Divisions:
There will be Two divisions:
Division A 24 hours.
Division B 6 hours
In each division the operating period must be continuous within the time period allocated for the contest.

2 Sections:
In each division there will be separate sections as follows

A Portable field station. Tx phone. Single operator.
B Portable field station. Tx CW. Single operator.
C Portable field station, Tx open, Single operator.
D Portable field station, Tx Phone, multi operator.
E Portable field station, Tx Open, multi operator.
F Portable field station, Tx VHF, Single operator.
G Portable field station, Tx VHF, multi operator.
H Home transmitting station, Emergency powered.
I Home transmitting station, Mains powered.
J Receiving stations.

3 Station Definition:
A portable station is one which operates from a power supply which is independent of any permanent installation, ie, batteries, solar, wind, portable motor generators.
A single operator station is one where the work involved in setting up the station is carried out by the person who operates the station. No assistance can be received apart from the provision of food and security etc,
In both cases however, a log keeper is permitted.
A Multi operator station is self explanatory.

4 Installations:
No radio station apparatus may be erected on the site more than 24 hours before the contestant/s begin/s operating.

5 Bands:
All amateur bands may be used with the exception of the 10,18 and 24 MHz bands.

6. Contacts:
Cross band contacts are not permitted.
Cross mode contacts are permitted, however they will count only as phone contacts for scoring purposes.

7 Size:
The size of any portable station shall be restricted to approximately that of an 800 metre diameter circle.

8 Multi Operator Stations:
Such stations shall provide a separate log for each band.
Only one transmitter may be used on a given band at any one time, be it operating in a phone or CW mode.
Only one call sign may be used from a multi operator station.

9 Contest Exchange:
The exchange between stations will consist of a number/letter combination comprising the RS/T report as applicable followed by a serial number commencing with 001 and increasing by one for every contact. Following the serial number, a letter must be added indicating the Section (A) to (J) in which the station is competing. For example, the number sent by a station operating in the VHF multi operator section would for the first contact be 57001G.
Both cyphers sent and received must be recorded in the log.

10 Repeaters:
Operation through any active terrestrial repeater is not allowed for scoring purposes, however, the use of such is allowed for the purpose of making contact arrangements.
Contact made by using orbiting satellites or EME as a medium are acceptable.

11 Modes of Operation:
AM,FM,SSB, all count as phone.
RTTY and CW are both regarded as CW.
It would not be expected that the more exotic modes would be used in this contest.

12 Scoring
Scoring For Portable FieldStations — Contacts Within
Australia.

A Portable/mobiles outside ones own call area (20 points)
B Portable/mobiles within ones own call area (15 points)
C Home stations in section H, outside ones own call area . . . 10 points,
D Home station sin Section H, within entrants call area . . . 5 points,
E Home stations in section I, 2 points irrespective of call area,

Scoring For Home Stations Emergency Powered: Contacts Within Australia.

A Portable/mobile stations outside entrants own call area . . . 15 points.
B Portable/mobile stations within entrants own call area, . . . 10 points.
C Home stations section H, irrespective of call area . . . 5 points.
D Home stations section I, irrespective of call area . . . 2 points.

Scoring For Home Stations Mains Powered: Contacts Within Australia.

A Portable/mobile stations outside entrants call area . . . . 10 points.
B Portable/mobile stations within entrants call area . . . 5 points.
C Home stations in section H, irrespective of call area . . . 2 points.

Scoring For Contacts With New Zealand Stations:
The NZART Field Day Contest will coincide with this contest, and the bands used are 3.5 and 7 MHz.

To avoid confusion ZL field Day Stations will prefix their callsigns with words Field Day or FD.
VK stations are encouraged to work these stations and may claim points as follows
Portable field stations Contacts with ZL FD stations, . . . 20 points.
Home stations emergency powered, contacts with ZL FD stations . . . 1 5 points.
Home stations mains powered, contacts with ZL FD stations, . . .2 points.
To allow for the propagation conditions that are normal between VK6 and ZL on the 3.5 and 7 MHz bands during the contest period the score between VK6 and ZL field day stations will be as follows;

A For portable VK6 stations . . . ZL FD stations. score . . . 30 points.
B For home stations emergency powered VK6 stations. ZL.FD score . . . 2 5 points.
C For home stations mains powered VK6 stations, ZL FD score . . . 5 points.

13 CW Contacts:
In all categories CW to CW contacts will earn double points.

14 Bonus Points:
For any contact made by using a natural power source, a bonus score of 10 points may be added. A natural power source is regarded as one where power is derived from solar cells, wind, methane gas, etc, as well as from batteries which are completely charged by natural means. All power produced in this category must have been derived independently of commercial mains or the use of petroleum derivatives.

15 Repeat Contacts:
Portable field stations and home stations under section H may contact other stations within these categories (Sections A to H) provided that a period of at least three hours has elapsed since the last contact with the station concerned. This applies for each band and mode. This repeat contact rule will apply also to those ZL portable stations that are operating in the NZART field day contest

16 Receiving Stations:
Stations in this section must record the serial numbers being sent by the stations operating in the contest within section (A to G) inclusive. QSO points will be on the same basis as for Home stations section (I).

17 Log Format:
All logs shall be set out under the following headings and in the order shown; Date: Time UTC: Band: Mode: Callsign of station worked. RS/T & serial number sent:
RS/T & serial number received: QSO Points. Multiplier. Bonus Points. Total Points Claimed. Each log page must carry a progressive total points score claimed at the bottom of each sheet. Scores claimed must be calculated by first multiplying the QSQ points score by any applicable multiplier and then adding any bonus points.

18 Summary Sheet:
For bonus points to be claimed, suitable evidence must be provided as to the method of natural power generation employed. Such evidence could take the form of a photograph of the generating equipment used or a signed statement by another amateur showing his callsign, declaring that he has inspected the generating equipment referred to.

19 Front Sheet:
Each log must be accompanied by a front cover sheet that provides the following information:
Name: Address: Callsign: Division (6 or 24 hours), Section (A to J), Number of Contacts: Claimed Score. This sheet must also indicate station location, equipment used, power generating system used and, in the case of multiple operator stations, a list of operators names and callsigns, together with their signatures. This front sheet must also carry a declaration signed by a licenced amateur as follows:
Declaration. I hereby certify that this station was operated in accordance with the rules and spirit of the contest.
Signed ..... Date.....

20 Multiple Station Operation:
In the case of amateurs who have entered the contest in the six hour single operators section it is allowable for them, upon returning to their home station, to make contacts with portable field stations. For this purpose they must submit a separate log which will be regarded as a check log only; ie they cannot enter into more than one section of the contest for competitive purposes. Operators who are interested in providing more field day activity are encouraged to adopt this practice where possible. It should be noted however, that the practice of multi—operator station participants considering themselves to be portable stations and making contacts with the portable field day station so as to bolster that sta-

tion's score is deemed to be not in the spirit of the contest, and,as such, contravenes the intent of the declaration on the front sheet./

21. Certificates And Trophy:
Certificates will be awarded to the winner in each section in both the six and twenty four hour divisions of the contest. The six hour certificates cannot be won by the 24 hour entrants. The contest manager also reserves the right to award other certificates where the effort made by a particular station is of special worthiness. The highest CW scorer outright in the contest irrespective of the section of the contest entered will receive a trophy in the form of the President's Cup to hold for a period of twelve months. This award is intended as an encouragement to operators to utilize the CW mode whenever possible.

22 Disqualification:
The general contest disqualification criteria as published in "Amateur Radio" in June 1988 apply to this and all WIA contests. It is again pointed out that you should read the above rules properly so as to understand them and ensure that your log does comply with the contest rules laid down.

23 Log Submission:
Logs should be forwarded to the WIA Federal Contest Manager, 37 Nobelius Drive, Legana. Tasmania 7277. The front of the envelope should be endorsed John Moyle Memorial Field Day Contest. Closing day for entries is 29th April 1989.

Commonwealth Contest 1989

Apparently, due to problems caused by the 75th Anniversary Celebrations of the RSGB, the unchanged rules for the 1989 Contest have not yet (December) been published in Radio Communications.

However, the Contest will run from 1200 UTC Saturday 11th March 1989 to 1200 UTC Sunday 12th March 1989
See rule details Amateur Radio December 1987, page 46.
Address for logs:

RSGB HF Contests Committee
PO Box 73
Lichfield Staffs WS13 6UJ
England

Commonwealth Contest 1988

The Commonwealth Contest, with its rules and scoring system unchanged since the early 1960s provides a basis for almost unending statistical comparisons. The total number of logs submitted was 36 down on last year's 149 which was perhaps on the high side due to the Golden Jubilee of the Contest. Australian logs were down eight to 36, our most meagre representation for some years. Last year's top three, VE7CC, VE6OU/3 and 6Y5HN again finished in the same order, VE7CC making 104 contacts less than the second runner but winning comfortably with 194 bonuses in his 471 contacts. Top QSO maker was ZC4AP with 592 — his operating was a delight to listen to, but his problem was to get bonus points through the G QRM.

Under reasonable band conditions, the 1988 scores were up on the previous year, but when bonus totals are considered, the top two at 194 and 171 hardly compared with the 228 and 213 that they recorded when again running 1,2 in 1982 which is not really remembered as an outstanding year.

We have a new winner for VK in 1988 in D F Kiesewetter VK2APK, who advanced from second last year. Russ Coleston, AX4XA was not far behind, and both were well clear of third place.

Among the more exotic areas noted in the results were ZB2, VP2, Z2, 5N, VO1, VU2 and 9J2 but it was again disappointing to see only 3 entries from ZL. GB5CC the RSGB HQ station was again active, and welcome for bonus points.

Top Ten

1	VE7CC	6213	6	ZC4AP	4470
2	VE6OU/3	6206	7	G3PEK	4447
3	6Y5HN	5709	8	G4BUO	4437
4	G3FXB	4985	9	AX4XA	4384
5	VK2APK	4529	10	VE5RA/6	4333

Australian Scores

5	VK2APK	4529	62	VK3MR	1440
9	AX4XA	4384	62	VK7RY	1387
14	AX2BQQ	3479	64	VK3DNC	1372
15	VK2AYD	3150	64	VK4TT	1372
20	AX3XB	2781	67	VKICA	1330
24	VK2AQF	2499	68	AX3KS	1279
25	VK6LW	2478	71	VK3MJ	1216
28	VK5GZ	2382	76	VK3BDH	1070
29	VK7RO	2377	78	VK3DOV	1037
30	VK2DID	2325	84	VK2AIC	942
31	VK4XW	2302	88	VK4BKM	832
32	VK8AV	2255	90	VK3XF	780
35	VK6RU	2120	92	VK5AGX	735
38	VK3DQ	1960	94	VK6IT	710
43	VI88SA	1860	98	VK5HO	575
48	VK40D	1761	101	VK7ZO	467
55	VK3JI	1640	102	VK5BS	460
61	VK6AJ	1460	111	VK7CH	217

Single band entries among the above were:

7 MHz	VK6IT	Overseas winner
14 MHz	VK6AJ	Overseas winner, VK3MR, VK4TT, VK4BKM, VK7CH

Receiving Section

3. Eric Trebilcock BCRS 195 1763

Pacific Area Scores

13	ZLIAIZ	3720
26	ZLIHV	2450
85	ZL3AGI	905

VK Team Event

Five years in a row — that is the VK2 record of success in the four man team event, this time nearly 4000 points ahead of VK4 with a further 2000 odd back to VK3. By next March, surely some of those VK8s should be recovered from their CQWW efforts to front up and give VK2 a run for their money!

Teams	1988	1987	1986	1985
VK2	13657	10811	11890	16272
VK4	9819	8013	10143	8359
VK3	7821	9988	10391	8784
VK6	6768	8988	9618	6482
VK5	5552	8773	8910	8761
VK7	4448	5109	6274	7982

Australian Awards

The Gold Medallion for the leading VK entrant was won by DF Kiesewetter VK2APK.

The Silver Medallions for the remaining members of the leading State Team were won by K. Nad VK2BQQ, DA Pilley VK2AYD, and E. Carruthers VK2AGF

How The Leaders Made Their Scores

QSOs/Bonus per band 80—10 metres (claimed)

VE7CC	41/33	65/42	223/51	104/41	38/27
VE6OU/3	49/20	127/50	222/45	159/41	18/15
6Y5HN	39/17	136/40	270/55	106/29	7/7
G3FXB	36/25	63/41	112/69	61/33	11/11
VK2APK	29/23	107/42	147/44	54/30	4/4
ZC4AP	17/6	115/9	230/44	145/14	85/9

Most QSOs	ZC4AA	592	VE6OU/3	575
Most Bonuses	VE7CC	194	G3FXB	179

Commonwealth Contest 1988

The fifty—first Commonwealth Contest attracted 113 entries — a significant reduction on last year, when the "Golden Anniversary" contest was held. Conditions were described variously as mixed, disappointing and (from some parts of the globe) — the best LF conditions ever! An increasing irritant to many entrants was the persistence of a number of non—Commonwealth stations in calling rare contest participants, to the general annoyance of all. It may be that this in some way accounts for the disappointing entry from outside the "large" Commonwealth countries.

The winner of the 1988 contest is, yet again, Lee Sawkins, VE7CC, but with his lead cut to only seven points over John Sluymer, VE6OU/3. In third place is Nigel Hoyow, 6Y5HN. The top three positions are a re—run of the 1987 result. Top British station is again Al Slater, who achieved fourth position overall.

The shortwave listeners section is won by Brad Bradbury, BRS 1066, with Don Piccirillo as runner—up.

Award Winners

Senior Rose Bowl: L. Sawkins, VE7CC

Junior Rose Bowl:	J. Sluuymer,	VE6OU/3
Col Thomas Rose Bowl:	A. Slater,	G3FXB
Receiving Rose Bowl:	CA Bradbury,	BRS 1066

Single Band Winners

7MHz UK	G3DYY
14MHz UK	G4CP
21 MHz UK	G3PJT
3—5 MHz O/s	VE1EP
7 MHz O/s	VK6IT
14 MHz O/s	VK6AJ
21 MHz O/s	VE3PTQ
28 MHz O/s	ZC4EE

Activity And Conditions

Again 14MHz supplied by far the majority of the traffic in the contest. 21MHz provided reasonable G to VK/ZL traffic, but has yet some way to go before it really shows its potential. 28MHz was the disappointment, with a few significant openings. To repeat the comment in last year's contest report, "perhaps next year?

The path from G to VK/ZL on 7MHz and 3.5MHz was disappointing, with very few contacts with ZL on 3.5, and a marginal path to VK6. 7MHz, although better, did not live up to expectations for long—haul contacts.

Several stations commented that although the old faithful callsigns were in there again this year, there were disappointingly few newcomers evident. The logs show some new faces but there must be some concern that the cw "art" is a dying one. Many entrants commented on the unique nature of the Commonwealth Contest and the regular entrants pledge continuing support. The HF Contents Committee would like to have seen more logs from the rarer countries, known to have been active in this year's contest, but who chose not to submit an entry.

GB5CC was again active, this time from QTH of G3OZF, and made over 400 QSOs, operating the full 24 hrs. However, the main TS930 transceiver developed a fault in the first hour of the contest, and for the majority of the contest a small TS680 was used which, although very effective, lacked the receive dynamic range necessary on 3.5 and 7MHz in such conditions. Apologies to all those who heard GB5CC but could not attract his attention!

Once again, thanks are due to a number of stations who submitted check logs — G3WP, G4OTU, G4UOL, GD3HDL, GW3SB, VE3EK and VE7COP. Particular mention should also be made of John Tutton, VK3ZC, who mounted a mini dx—pedition to VK1 for the contest, to operate as VK1CA.

Several stations who submitted entries will find their claimed scores have been drastically changed — in some cases upwards, in other cases downwards. It pays to read the rules when completing your log!

A number of entrants asked why last year's results contained scores which did not divide by five — given the scoring basis for the contest. The answer is that the adjudicator deducts points according to a defined formula for errors in QSO exchange information, which, as again this year, leads to scores which do not necessarily remain divisible by five.

The Commonwealth Contest will be back next year.

See you in there! G3OZF

(Information re Commonwealth Contest Contributed and Compiled by John Tutton VK3ZC)

British Amateur Radio Teleprinter Group

BARTG Spring RTTY Contest 1989

When? 0200 GMT Saturday March 18th until 0200 GMT Monday March 20th 1989.

The total contest period is 48 hours but not more than 30 hours of operation is permitted. Time spent as listening periods count as operating time. The 18 hours of non operating time can be taken at any time during the contest period, but off periods may not be less than 3 hours at a time. Times on the air must be summarized on the summary sheet.

Who? There will be separate categories for single operator, multi operator and short wave listener stations.

Bands — 3.5, 7.0, 14.0, 21.0, and 28 MHz Amateur Bands.

Stations — Stations may not be contacted more than once on any one band but additional contacts may be made with the same station if a different band is used.

Countries — The ARRL DX Countries list will be used, and in addition, each W/K, VE/VO and VK Call area will be counted as a separate country.

Note: W/K, VE/VO and VK count once each only for QCA purposes.

Messages — Messages will consist of:—

(A) Time GMT: This must consist of a full four figure group and the use of the expression "same" or "same as yours" are not permitted.

(b) RST and Message Number : The number must consist of a three figure group and start with 001 for the first contact made.

Points — Points can be claimed as follows:—

(A)All two-way RTTY contacts with other stations within one's own country will score two points.

(B) All two-way contacts with other stations outside one's own country will score ten points.

(C)All stations can claim a bonus of 200 points for each country worked, including their own. Note that any one country may be counted again if worked on a different band but continents are counted once only.

Note:— Proof of contact will be required in cases where the station worked does not appear in any other contest log received or station worked does not submit a check log.

Scoring — (A) Two—way contact points times the total of countries worked.

(B) Total country points times 200 times the number of continents worked (max 6)

(C) Add (A) and (B) together to obtain the final score.

Sample calculation:—

Exchange Points (302) X Countries (10) = 3020

Country Points (10) X 200 X Continents (3) = 6000

(A) and (B) Added together to give a score 9020

Log And Score Sheets: — Use a separate sheet for each band and indicate all times on the air. Logs To Contain:— Date, Time GMT, Callsign of each station worked, RST and Message number sent, Time, RST and message number received and the points claimed.

Note:— Logs received from short wave listeners must contain callsign of station heard, report sent by that station and callsign of the station being worked. Also date and time GMT that the QSO was logged. Incomplete loggings are not eligible for scoring and will be classified as check logs. The summary sheet should show the full scoring, the times on the air, address for correspondence, and in the case of multi operator stations, the names and callsigns of all operators involved with the operation of the station during the contest.

All Logs Must Be Received By May 27th 1989 In Order To Qualify.

Summary and Log Sheets:— Are available from the Contest Manager at the address shown below, in the UK on receipt of a large (A4) SAE. All other countries outside the UK require no envelope but will need 6 IRC's to cover the cost of postage.

Send Your Contest Or Check Log To
Peter Adams G6LZB
464 Whippendell Road
Watford
Herts
England WD1 7PT

The judge's decision will be final and no correspondence can be entered into in respect of incorrect or late entries. All logs submitted shall remain the property of the

British Amateur Radio Teleprinter Group.

Certificates will be awarded to the leading stations in each of the three groups, the top station in each continent and to the top station in each W/K, VE/VO and VK call area.

Additional Notes:— If a contestant manages to contact 25 or more different countries on two—way RTTY during the contest, a claim may be made for the quarter century award (QCA) issued by BARTG and for which a charge of 4 dollars US or 18 IRC's is made.

Holders of existing QCA Awards should indicate and list new countries to be added to their existing records.

Make your claim at the same time you send in your log.

However, in view of the high volume of work which the Contest Manager will have to deal with, it will not be possible to prepare and dispatch any new awards or to up—date any existing records until the final results of the contest have been evaluated and published.

Additionally, if any contestant manages to contact stations on two—way RTTY within each of the six continents and the BARTG Contest Manager receives either a contest log or a check log from each of the six stations concerned, a claim may be made for the WAC Award issued by the American RTTY Journal.

The necessary information will be sent to the journal after the contest results have been evaluated and despatched. The journal will issue the WAC Award. A charge is now made for this award. **ar**

AMSAT AUSTRALIA

Information Nets

Colin Hurst VK5HI
8 Aindell Rd
Salisbury Park 5109

National Co-ordinator
Graham Ratcliff VK5AGR
Control : VK5AGR
Amateur Checkin : 0945 UTC Sunday
Bulletin Commences : 1000 UTC
Primary Frequency : 3685 kHz
Secondary Frequency : 7064 kHz
AMSAT SW PACIFIC
2200 UTC SATURDAY
14.282 MHz.

Participating stations and listeners are able to obtain basic orbital date including Keplerian elements from the AMSAT AUSTRALIA net. This information is also included in some WIA Divisional Broadcasts.

Swansong

This issue of Amateur Radio is my last column for AMSAT-Australia. For nearly six years I have been endeavouring to ensure that satellite communicators and general enthusiasts of Amateur Radio Satellites were well informed on the "latest" news and information relating to the Oscars and Russian RS Satellites and of course the respective American and Russian Radio Amateurs who have provided contacts from space. It is interesting to note that this column has had only two columnists over the last 12 years, namely, Bob Arnold VK3ZBB and myself. Bob has over the last six years contributed the Launches and Returns of all objects into space, thereby effectively contributing to the AMSAT-Australia column for a period of 12 years. Thanks once again Bob for your support and encouragement. Similarly I must thank Graham VK5AGR for his total and uncommitted support over the last six years. Which brings me my successor, namely Maurie Hooper VK5EA who has kindly volunteered to do the honours for the years to come. Welcome Maurie. I trust that readers will enthusiastically support and assist Maurie as they have supported me.

AMSAT-AUSTRALIA Newsletter and software

The fine monthly publication AMSAT-AUSTRALIA Newsletter published on behalf of AMSAT-AUSTRALIA by Graham VK5AGR now has 300 plus subscribers. Should you also wish to subscribe then send a cheque for $20 made payable to AMSAT-AUSTRALIA and post to:

AMSAT-AUSTRALIA c/o PO Box 2141, GPO Adelaide SA5001.

The Newsletter provides the latest news items on all Satellite activities and is a must for all those seriously interested in Amateur Satellite activities.

Graham also provides a Software Service of general satellite programs made available to him from various sources. The only requirements to make use of this service is to send Graham a Diskette nominating your requirements, a nominal $10 donation to AMSAT-Australia and sufficient monies for return postage and packing. To obtain details of the programs available and other AMSAT-AUSTRALIA services send an SASE to Graham.

Useful AO-13 equations by G3RUH

One of the most prolific writers of satellite technical articles in recent years has been James Miller G3RUH. Once again we have the opportunity to present some extremely useful nitty gritty formulae and computer programs, written in the inimitable G3RUH manner.

To: All AO-13 Number Crunchers, Computers and Calculating Engines:

AO-13 users will have noticed the spacecraft's MA counter loses about 6 seconds per day when compared with ground-based software. You can use the following formula to predict actual events to within a second or so:

T event = (Orbit + MA/256)* 0.476905484 - 199.767268 days UTC. 1989

Example: Mode B off, Orbit 449, at MA 240 happens at

Tevent=(449+240/256)* 0.476905484 - 199.767268 = 14.8103932 = 1989 Jan 14 (Sat) @ 1926:58 UTC

NASA Keplerian element sets have AO-13's orbit number wrong by 1.

"Correct" value is telemetered by AO-13. You can compute the correct one for 1989 from the following formula:

ONO = INT(DATIM*2.096994 + 418.885)

where DATIM = DAY + (HR +MIN/60)/24 (= epoch time in kep sets) and INT means "integer part of"

You can check a kep set by simply plugging in the epoch time at "DATIM"

Oscar-13 Keplerians (Smoothed)

Epoch year=1988: Epoch Day Number=330.289337: Inclination=57.43:

RAAN=230.40: eccen=0.6610 ARG of per=194.35: Mean Anomaly=0.0

Mean motion=2.09699368 rev/day: REV=344: SMA=25783

These are based on smoothing all kep sets (about 6) to date. Please print these

equations out and pin them to your shack wall — you need never want again.

Mode L SSB Uplink power requirements

EIRP = (R/40000)^2/(COS(SQ))^12 kW assuming RHCP, and a SQ < 30 where R = range in km from your QTH to AO-13, and SQ = spacecraft "squint" or pointing angle in degrees. This formula is based on empirical data collected from dozens of measurements. It gives a "minimum" SSB return of about 6 dB SNR. The spread is MAX = 37.5 dBW @ 40000 km with a squint angle = 30 degrees: MIN = 27.0 dBW @ 28000 km at 0 degrees squint angle. All these calculations assume that the transponder noise floor is audible and normal loading. Double the power requirement for linear polarization.

To: All Algorithmists and leap year haters

The following notes are reproduced from my full article that was widely circulated in 1986 (and just as widely ignored!).

Work the world on 70 cm with the new all-Australian SATRACKER 270 as reviewed in A.E.M. August 1987.

The **SATRACKER 270** is suitable for mast or roof mounting and is supplied in a complete, easy to assemble kit with detailed instruction, ready for connection to your 50 ohm transmission line.

We also have the SA200 Crossed Dipole Antenna as described in the A.E.M. Weather Satellite Project.

For all your antenna needs including high quality HF Beam, Mobile Whips, Coaxial Cable, Connectors and Fibre Glass Stacking Bars, contact:

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30.6 days hath September

by James Miller G3RUH

All satellite programs involve manipulating dates in some way and if you ever need an example of ugly coding, look no further than the typical amateur calendar routine! I recently came across one famous "Loony" program that took over 30 program lines just to manipulate two dates AND got it wrong. Here's a right way!

Algorithm 1: Date to day number

Takes a date in the form of year, month and day of month and calculates its day number. Valid from 1582 onwards:

```
DO = -722528:REM For AMSAT day number
DO = -428:REM For GENERAL day number
DO = 1720982:REM For Julian Day at noon
```

(Choose one of the above three only)

```
REM enter wih Year YR e.g. 1989, Month MN. Day DY. Result is Day Number DN  Y = YR: M = MN: D = DY: REM Preserve YR. MN. DY
IF M <= 2 THEN M = M+12: Y = Y-1
DN = -INT(Y/100)+INT(Y/400)+15 + INT(Y*365.25) + INT((M+1)*30.6) + D + DO
```

NOTES:

1. You can usually omit the century parts of the calculation so that:

```
DN = INT(Y*365.25) + INT ((M+1)*30.6) + D + DO
```

This restricts the algorithm to 1900 Mar 01 until 2100 Feb 28.

2. Three values for DO are given: choose only one though!

ALGORITHM 2: Day number to date

```
REM Enter with day number (DN), Results are Year (Y), Month (M) and
REM Day (D), the day (D$), and month (M$) as strings.
D = DN - DO:     REM Note 1
DW = (D+5) - 7*INT((D+5)/7): REM Note 2
D = D + INT (INT((D+36387)/36524.25) * 3/4) - 15:     REM Note 3
Y = INT((D-122.1)/365.25):     D = D-INT(Y*365.25)
M=INT(D/30.61): D=D-INT(M*30.6)
M=M-1: IF M > 12 THEN  M=M-12: Y = Y+1
D$ = MID $("Sun Mon Tue Wed Thu Fri Sat".3*DW+1.3):REM Note 2
M$ =MID $("Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec ".3*M-2.3): REM Note 4
```

Notes:

1. Value for DO must be as chosen for date to day number algorithm 1.
2. DW is day-of-week, and is O for Sunday. Omit if you don't need.
3. You may omit this line for dates within 1900 Mar 01 - 2100 Feb 28
4. Omit if you don't want the month in letters.
5. Date$=STR$(Y)+ " " +M$+" "+STR$(D) +" ["+D$+"] will generate a string like: 1988 Dec 25 [Sun]

QUICK ALGORITHMS 3:

The following two algorithms will give you GENERAL day numbers from the year and day of the year (Jan 1st = 1):

Date to Day Number

```
DN = INT((YEAR-1)*365.25) + DAY
```

Day Number to Year/Day of Year

```
YEAR = INT((DN+365)/365.25)
DAY = DN - INT((YEAR-1)*365.25)
```

Valid from 1901 Jan 01 - 2100 Dec 31 (General day numbers 693976 thru 767024).

The GENERAL day number here is the SAME as for algorithms 1 and 2 above.

WARNING - Don't Ignore This

Int(X) means "the largest integer smaller than X". Thus Int(-1.5) is -2. Some machines will give -1. The definition given is regular through zero.

If your machine gives -1 take great care - and complain to the manufacturer! In addition it is assumed that your computer/calculator can multiply 0.6 by 5, or divide 21 by 7 and get the result 3, not 2.9999999. If it doesn't you may need to take corrective action.

Best wishes - James G3RUH, Cambridge, England.

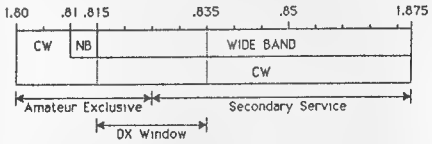
1989 Jan 03 [Tue] (General day number 726120, Amsat day 4020)

SK de Colin VK5HI.

BAND PLANS FOR THE AMATEUR RADIO SERVICE

1 The MF Band

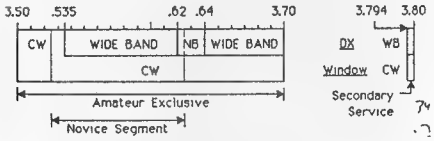
1.1 The 1.8 MHz Band (160 metres)
1.800 — 1.875 MHz



1.870 +/- 4 kHz
Avoid these frequencies

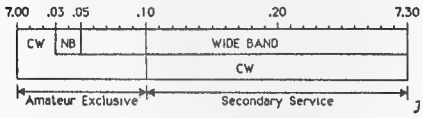
2 The HF Bands

2.1 The 3.5 MHz Band (80 metres)
3.500 — 3.700 MHz
and 3.794 — 3.800 MHz

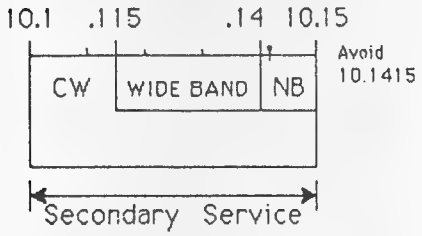


3.794 + 1 kHz
Avoid these frequencies

2.2 The 7 MHz Band (40 metres)
7.000 — 7.300 MHz

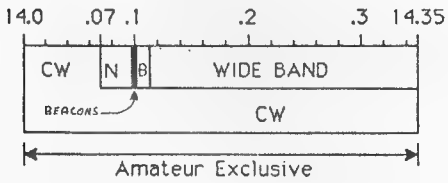


2.3 The 10 MHz Band (30 metres)
10.100 — 10.150 MHz



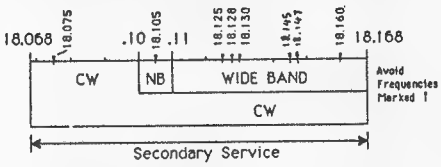
10.1415 +/- 4 kHz
Avoid these frequencies

2.4 The 14 MHz Band (20 metres)
14.00 — 14.350 MHz



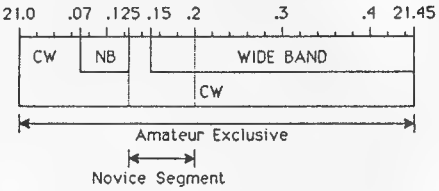
14.100 +/- 500 Hz	Beacon Guard Band
14.230	SSTV calling frequency
14.250	FAX calling frequency
14.095—14.112	Packet Radio (NB: avoid beacons 14.100)

2.5 The 18 MHz Band (17 metres)
18.068 — 18.168 MHz



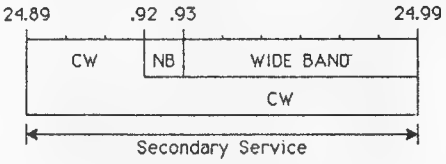
Avoid these frequencies
18.075 +/- 4 kHz
18.105 "
18.125 "
18.128 "
18.130 "
18.145 "
18.147 "
18.160 "

2.6 The 21 MHz Band (15 metres)
21.000 — 21.450 MHz



21.150 +/- 500 Hz	IBP Beacon Guard Band
21.340 +/- 5 KHz	SSTV

2.7 The 24 MHz Band (12 metres)
24.890 — 24.990 MHz



Avoid these frequencies
24.900 +/- 4 KHz
24.930 "

W.1.A. 1989 DATA LIST

The following information has been compiled as a service to members.

The contents came from various sources and our thanks must go to those who contributed, some being VK8HA, VK6HU, VK2DAY, VK5AGR, VK1RH, VK3XEF, FTAC, VK2AOU, ARRL, along with several others who assisted indirectly.

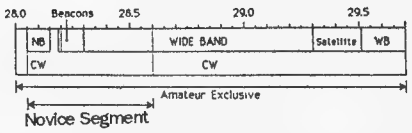
Information has been checked as correct at the time of compilation, but some errors will be inevitable. Should any individual, group or organisation have amendments or suggestions for future data editions these will be most welcome and should be addressed to :

Data Information Update,
WIA Executive Office,
P.O. Box 300,
Caulfield South Vic 3162.

Only by this type of feedback can we hope to maintain an up to date and accurate data base.

Bruce R. Kendall VK3WL
Data Editor

2.8 The 28 MHz Band (10 metres)
28.000 — 29.700 MHZ



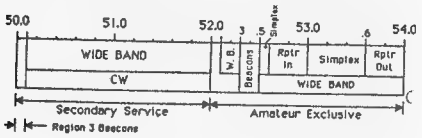
28.190 — 28.200	IBP Beacon Segment
28.200 — 28.300	Existing Beacons until 1 Jan 1990
28.680 +/- 5 kHz	SSTV
29.300 — 29.510	Satellite Down Link
29.510 — 29.700	Wide Band (FM)
29.520 — 29.580	FM Repeater Inputs (Note 1)
29.600	FM Simplex
29.620 — 29.680	FM Repeater Outputs (Note 1)

Note 1: Four repeater channels have been allocated, spaced at 20 kHz with 100 kHz

offset.

3 The VHF Bands

3.1 The 50 MHz Band (6 metres)
50.0 — 54.0 MHz



50.000 — 52.00	Restricted use segment (Note 1)
52.000 — 52.01 0	EME
52.010 — 52.050	DX CW
52.025	CW calling frequency
52.050	MS calling frequency
52.050 — 52.100	DX CW/Phone
52.075	RTTY calling frequency
52.100	Phone calling frequency (primary)
52.200	Phone calling frequency (secondary)
52.300	SSTV calling frequency
52.300 — 52.400	Beacons - secondary (Note 3)
52.400 — 52.500	Beacons - primary (Note 3)
52.525	International FM Calling
52.600 — 54.000	FM simplex and repeaters (Note 2)
52.600 — 52.975	Repeater inputs - allocated two/state
53.500	National FM calling
53.600 — 53.975	Repeater outputs

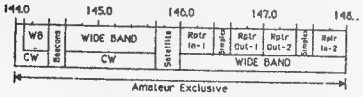
Notes: 1) DOC provided the conditions for use of 50-52 MHz in two letters as follows:
(a) DOC M83/037 of 7 Jun 84, and
(b) DOC M83/637 of 9 Oct 84.

Letter (a) sets out the conditions of use and letter (b) revised the relaxed South Australia and Tasmania conditions to apply after the revised SBS termination of channel O Melbourne, viz 6 Jan 86. Note that this is the subject of current WIA/DOC joint quarterly meetings.

2) It was proposed at the 1986 Federal Convention that the repeater split be increased from 600 kHz to 1 MHz and that a transition period for this change be allowed. The band plan has been modified accordingly.

3) The beacon frequencies are allocated in accordance with the beacon plan on a state basis.

3.2 The 144 MHz Band (2 metres)
144.0 — 148.0 MHz



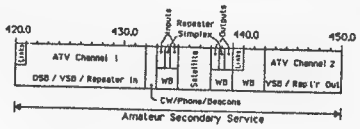
144.0 0 — 144.01	EME
144.01 — 144.05	DX CW
144.025	CW calling
144.050	MS calling
144.05 — 144.10	DX CW/Phone
144.075	RTTY calling freq
144.10	Phone calling (primary)
144.20	Phone calling (secondary)
144.30	SSTV calling
144.40 — 144.50	Beacons — primary (Note 3)
144.50 — 144.60	Beacons—secondary (Note 3)
144.800 — 144.900	Data Transmission
144.925 — 144.975	CW Beacons
146.450	Primary voice
146.500	National Calling (primary)
146.600	RTTY
147.300	ATV Liaison
147.325	RTTY
147.350	RTTY
147.400	ATV Liaison
147.425	ATV Liaison
147.450	ATV/SSTV/FAX
147.475	SSTV/FAX Liaison
147.500	National Calling (secondary)
147.550	Micro nets
147.575	Data nets
147.600	Data packet

Notes 1) FM channel spacing is 25 KHz and repeater offset is 600 KHz.
2) FM channel numbers designated by last four digits of (repeater out put) frequency.
3) The beacon frequencies are allocated in accordance with the beacon plan on a state basis.

4 The UHF Bands

4.1 The 420 MHz Band (70 centimetres)
420.0 — 450.0 MHz

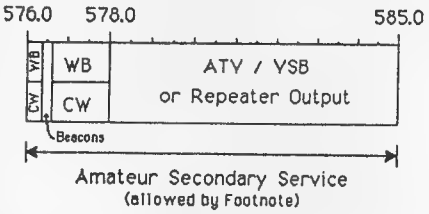
420.00 — 432.00	ATV channel 1 DSB/VSB
426.25	Vision
431.75	Sound
420.05 — 421.00	Repeater linking - A pairs (Note 4)
432.00 — 432.01	DX EME
432.01 — 432.025	DX CW
432.025	Calling frequency
432.025 — 432.050	DX MS
432.050	Calling frequency
432.050 — 432.075	DX RRTY
432.075	Calling frequency
432.075 — 432.100	DX Phone
432.100	Calling frequency (primary)
432.100 — 432.200	Phone
432.200	Calling frequency (secondary)
432.200 — 432.300	SSTV
432.300	Calling frequency
432.300 — 432.400	CW/Phone
432.400 — 432.600	Beacons (Note 5)
432.600 — 433.000	General all modes
433.025 — 434.975	FM repeater inputs and simplex
433.025 — 433.725	FM repeater inputs
433.750 — 434.250	Simplex
434.275 — 434.975	FM repeater inputs
435.000 — 438.000	Satellites
438.025 — 439.975	FM repeater outputs and simplex
438.025 — 438.725	FM repeater
438.025	Mobile voice
438.075	Mobile voice (secondary)
438.125	RTTY
438.175	Mobile voice
438.225	Mobile voice (secondary)
438.275	WICEN portable
438.325	Mobile voice
438.375	Mobile voice (secondary)
438.425	Mobile voice
438.475	Mobile voice
438.525	Mobile voice (national primary)
438.575	Data
438.625	WICEN portable
438.675	Mobile voice (secondary)
438.725	RTTY
438.750 — 439.250	FM simplex
438.775	RTTY
438.800	WICEN
438.825	Voice (secondary)
438.875	Data
438.925	SSTV
439.000	Voice (national primary)
439.050 — 439.075	Data packet
439.125	Voice secondary
438.275 — 439.975	FM repeater outputs
439.275	Mobile voice
439.325	RTTY
439.425	Mobile voice
439.475	RTTY
439.575	Mobile voice
439.725	Mobile voice
439.875	Mobile voice
439.975	SSTV
440.050 — 441.000	Repeater linking - B pairs (Note 4)
440.000 — 443.000	Experimental — all modes



443.000 — 450.000	ATV channel 2 VSB
444.25	Vision carrier
449.75	Sound carrier

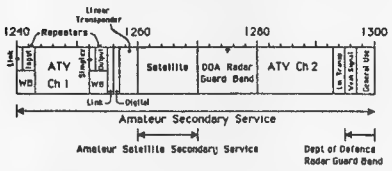
Notes: 1) FM channel spacing is 25 kHz and repeater offset is 5 MHz.
2) FM channel numbers designated by last four digits of (repeater out put) frequency.
3) FM channels with no specific rec ommended use may be used for any purpose.
4) A pair of frequencies are to be used repeater linking. Maximum power for inter repeater linking is 5 watts.
5) The beacon frequencies are allocated in accordance with the beacon plan on a state basis.

4.2 The 576 MHz Band (50 centimetres)
576.- — 585.0 MHz



Frequency (MHz)	Details
576.00 — 576.01	EME
576.01 — 576.05	DX CW
576.05 — 576.10	DX CW/Phone
576.10 — 576.40	General CW/Phone
576.40 — 576.50	Beacons - secondary
576.50 — 576.60	Beacons - primary
576.60 — 578.00	General all modes
578.00 — 585.00	ATV, VSB or Repeater output
579.25	Vision carrier
584.75	Sound carrier

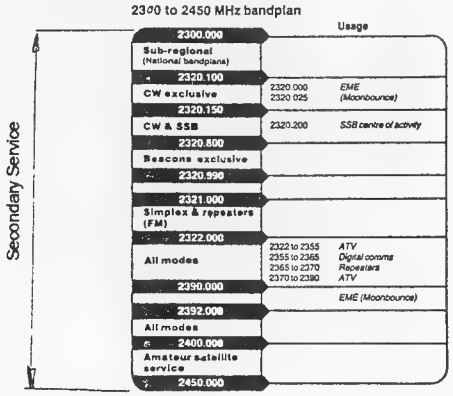
4.3 The 1240 MHz Band (23 centimetres)
1240.0 — 1300.0 MHz



Frequency (MHz)	Details
1240.00 — 1241.00	FM Relays and Links (Note 3)
1241.00 — 1243.00	FM Repeater inputs
1243.00 — 1252.00	ATV channel 1
1246.25	Vision carrier
1251.75	Sound carrier
1252.00 — 1253	FM simplex
1252.1	RTTY
1252.2	RTTY
1252.3	Voice (secondary)
1252.4	Voice (secondary)
1252.5	Voice (national simplex)
1252.6	Voice (secondary)
1252.7	Voice (secondary)
1252.8	Data
1252.9	Data
1253.0	ATV Liaison
1253.05 — 1255.00	FM Repeater outputs
1253.05	RTTY
1253.10	Mobile voice
1253.15	RTTY
1253.20	Mobile voice
1253.25	Data
1253.30	Mobile voice
1253.35	Data
1253.40	Mobile voice (secondary)
1253.50	Mobile voice (primary)
1253.60	Mobile voice (secondary)
1253.70	Mobile voice
1253.80	Mobile voice
1253.85	ATV Liaison
1253.90	Mobile voice
1253.95	ATV Liaison
1254.00	Mobile voice
1254.10	Mobile voice
1254.15	RTTY
1254.20	Mobile voice
1254.25	RTTY
1254.30	Mobile voice
1254.35	Data
1254.40	Mobile voice
1254.45	Data
1254.50	Mobile voice
1254.60	Mobile voice
1254.70	Mobile voice
1254.80	Mobile voice
1254.90	Mobile voice
1255.00	Mobile voice
1255.05 — 1256.00	FM Relays and Links (Note 3)
1256.00 — 1257.00	Digital and Packet Radio
1257.00 — 1260.00	In—band and cross—band Linear Transponder
1260.00 — 1270.00	Satellite Communication (WARC 1979)
1270.00 — 1280.00	General use except in areas where these fre quencies are in use for Radio Location (Note 4)
1280.00 — 1293.00	ATV channel 2
1287.25	Vision carrier
1292.75	Sound carrier
1293.00 — 1295.00	In—band Linear Transponder
1295.00 — 1297.00	Weak signal modes, except in areas where these frequencies are in use for Radio Location (Note 4)
1296.40 — 1296.59	Beacons (Note 5)
1297.00 — 1300.00	General use except in areas where these fre quencies are in use for Radio Location (Note 4)

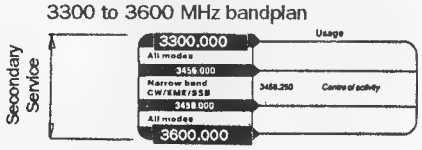
Notes: 1) FM channel spacing is 25 kHz and repeater offset is 12 MHz.
2) FM channels with no specific rec ommended use may be used for any purpose.
3) A pair of frequencies are to be used repeater linking. Maximum power for inter repeater linking is 5 watts.
4) In Australia, some Department of Aviation RADARs are centered on 1275.0 MHz and 1305.0 MHz, while some Department of Defence RADARs are centered on 1300.0 MHz. Accordingly the frequencies 1270.0 to 1280.0 MHz and 1295.0 to 1300.0 MHz are allocated as a guard band to ensure no harmful interference is caused to the primary user.
5) The beacon frequencies are allocated in accordance with the beacon plan on a state basis.

4.4 The 2300 MHz Band (13 centimetres)
2300.0 — 2450.0 MHz

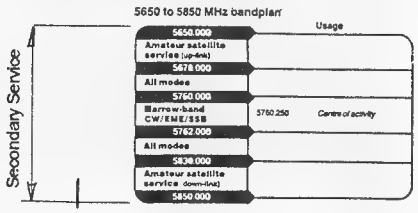


5 The SHF Bands

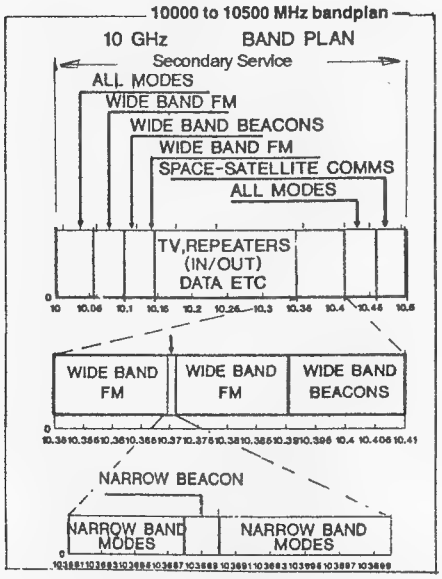
5.1 The 3300 MHz Band (9 centimetres)
3300.0 — 3600.0 MHz



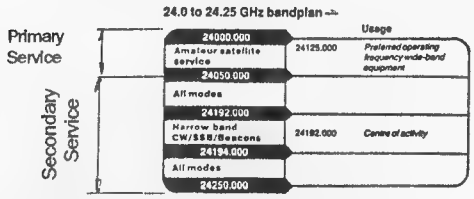
5.2 The 5650 MHz Band (5 centimetres)
5650.0 — 5850.0 MHz



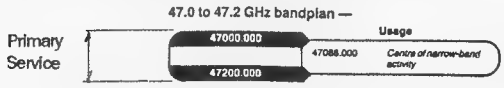
5.3 The 10 GHz Band (3 centimetres)
10.0 — 10.5 GHz



5.4 The 24 GHz Band Plan (1 centimetre)
24.00 — 24.25 GHz



5.6 The 47 GHz Band Plan (6 Millimetre)
47.00 — 47.20 GHz



U.S. 10M FM REPEATERS

Out	In	Callsign	Out	In	Callsign
29.62	29.52	N6AHW			N8EEG
		KC4CI			WB3FKO
		KE4I0			WB7DRU
		WDOALH			WB5ITT
		KB5VC			K5TYV
		K3SP			W9ZYO
		W1BHD			
		WD80XD	29.66	29.56	N9PL
		WOJZY			N6BPK
		WA2TMZ			WOIA
		KD8C			KC3AM
		KC50U			N3AUY
		W5HZZ			W9LM
		K3CFY			AEON
		WD8CIY			K2MZ
		KC50Q			WA6GBC
		WB9ZRB			KC5EJ
		VE3TFM (Canada)			
29.64	29.54	WB4QVT	29.67	29.57	KAIDFI
		KE4QC			
		K6GZK	29.68	29.58	KD4VD
		KI4CA			N9DVF
		WO4B			KD4DN
		WAONSH			KA3KPV
		KOGBZ			W2SEX
		N5ARU			WB9STA
		W3DID			KD9FA
		WBOARL			W4MM
		K2KLN			KA4ZAY

CALL SIGN SUFFIXES

Amateur station call signs normally commence with the letters "VK" followed by a numerical State identifier (ie 1/2/3/4/5/6/7/8/9/ or 0). However, to commemorate special events the use of "VI" or "AX" may be authorised on a temporary basis. The alphanumeric series outlined is suffixed with up to three letters which indicate the class of amateur licence held and the individual identity of the station. Call sign suffixes are allocated according to the following table:

Two Letter Suffixes:

All two-letter suffixes except "AA" and "WI" indicate a full call licensee.
AA = Offical DOTC call sign.
WI = Allocated to the Wireless Institute of Australia.

Three Letter Suffixes:

AAA—AZZ = Full call licensees
BAA—BZZ = Full call licensees
CAA _CZZ = Full call licensees
DAA—DZZ = Full call licensees
EAA—EZZ = Full call licensees
FAA—FZZ = Full call licensses
GAA—GZZ = Full call licensees (Note: GGA-GGZ-allocated to the Girl Guides Association)
HAA—HZZ = Not allocated
IAA—IZZ = Not allocated
JAA—JZZ = Combined licensees
KAA-KZZ = Combined licensses
LAA—LZZ = Novice licensees
MAA—MZZ = Novice licensees
NAA—NZZ = Novice licensees
OAA—OZZ = Not allocated
PAA—PZZ = Novice licensees
QAA—QZZ = Not allocated, can be confused with Q Codes
RAA—RZZ = Beacons and repeaters
SAA—SZZ = Full call licensees (Note: SAA—SDZ — allocated to the Scout Association)
TAA—TZZ = Limited licensees
UAA—UZZ = Limited licensees
VAA—VZZ = Novice licensees
WAA—WZZ = Full call licensees.
(Note: WIA—WIZ allocated to the WIA)
XAA—XZZ = Limited licensees
YAA—YZZ = Limited licensees
ZAA—ZZZ = Limited licensees

Note: Certain "non—standard" suffixes are allocated including:
RAN, GGx, TTx, ITU, BSx, SJx, etc.

NEW ZEALAND AMATEUR REPEATERS

TWO METRE BAND—FM REPEATERS

Name	Site	Output Freq.	Height mASL	EIRP
Far North 710	Mount Maungataureia	147.100	513	12
Kaikohe 715	Browns Hill	147.150	388	10
Whangarei 720	Parakiore	147.200	392	25
Dargaville 7175	Pukewharariki	147.175	320	20
Rodney 730	Dome	147.300	341	20
Auckland 690	Ruaotewhenua	146.900	391	25
Bombay 670	Mount Puketutu	146.700	376	25
Auckland 6625	Port Waikato	146.625	403	1000
Tairua 6975	Tairua	146.975	349	100
Waikato 695	Mount Te Aroha	146.950	944	40
Tauranga 680	Mount Minden Te Puna	146.800	286	10
Edgecumbe 700	Mount Edgecumbe	147.375	777	20
Waitomo 7375	Rangitoto Range	146.850	869	100
Tokoroa 7025	Whakamaru	147.025	743	50
Rotorua 735		147.350	869	7
Taupo 675	Maroanui	146.750	897	12
Taumarunui 715	Hikurangi	147.150	770	50
Kakaramea 7275	Kakaramea	147.275	1313	25
Poverty Bay 680	Kaiti Hill	146.800	122	10
Gisborne 690	Whakapunake	146.900	950	10
Napier 725	Taraponui	147.250	1308	25
Hawkes Bay 670	Kahuranaki	146.700	652	20
New Plymouth 720	Power Station Chimney	147.200	190	12
Egmont 705	East Mount Egmont	147.050	1559	100
Wanganui 690		146.900	658	11
Taihape 6775		146.775	799	
Southern Hawkes Bay 665	Mount Wharite	146.650	915	25
Manawatu 7125	Pahiatua Track	147.125	488	8
Levin 720	Moutere	147.200	50	40
Masterton 680	Mount Rangitumau	146.800	604	25
Rewa 735	Mount Rewa	147.350	604	25
Holdsworth 7175	Mount Holdsworth	147.175	1470	25
Barton 7325	Mount Barton	147.325	1300	25
Southern Wairarapa 715	Warrens Airstrip	147.150	500	20
Kapiti 685	Mount Field	146.850	615	50
Climie 730	Mount Climie	147.300	867	100
Titahi Bay 675	Onepoto Reservoir	146.750	90	10
Belmont 710	Mount Belmont	147.100	450	100
Lower Hutt 700	Mount Fitzherbert	147.000	377	90
Golden Bay 735	Richmond Hill	147.350	620	13
Motueka 670	Mount Campbell	146.700	1328	25
Nelson 720	Grampians	147.200	392	40
Blenheim 695	Jamies Knob	146.950	277	4
Murchison 680	Mount Murchison	146.800	1469	40
Westport 675	Cape Foulwind Lighthouse	146.750	91	150
Westport 715	Mount Rochfort	147.150	1041	20
Kaikoura 690	Kaikoura Peninsula	146.900	91	15
Greymouth 695	Sewell Peak	146.950	834	20
Christchurch 675	Marley Hill	146.750	488	20

Cont next page

AUSTRALIAN BEACONS

Call Sign	Frequency MHZ	Site
VK2RCW	3.699	Dural
VK5WI	28.260	
VK2RSY	28.262	Sydney
VK6RWA	28.264	
VK6RTW	28.266	Albany
VK8VF	28.268	Darwin
VK4RTL	28.270	Townsville
VK6RPH	50.066	Perth
VKOCK	52.150	Macquarie Island
VK8VF	52.200	Darwin
VK2RBH	52.300	Broken Hill
VK6RTT	52.320	Carnarvon
VK2RHV	52.325	Newcastle
VK3RGG	52.330	Geelong
VK4ABP	52.345	Longreach
VK6RTU	52.350	Kalgoorlie
VK7RST	52.370	Hobart
VK1RCC	52.410	Mt Majura
VKOMA	52.418	Mawson
VK2RSY	52.420	Sydney
VK2RGB	52.425	Gunnedah
VK3RMV	52.435	Hamilton
VK4RTL	52.440	Townsville
VK4RIK	52.445	Cairns
VK5VF	52.450	Mt Lofty
VK6RPH	52.460	Perth
VK6RTW	52.465	Albany
VK7RNT	52.470	Launceston
VK8RAS	52.485	Alice Springs
VK6RBS	144.022	Busselton
VK4RTT	144.400	Mt Mowbullan
VK1RCC	144.410	Mt Majura
VK2RSY	144.420	Sydney
VK3RTG	144.430	Melbourne
VK3RMV	144.435	Hamilton
VK4RIK	144.445	Cairns
VK4RTL	144.445	Townsville
VK6RTW	144.465	Albany
VK7RMC	144.470	Newham
VK8VF	144.480	Darwin
VK8RAS	144.485	Alice Springs
VK3RGG	144.530	Geelong
VK3RGI	144.535	Gippsland
VK5RSE	144.550	Mt Gambier
VK6RPB	144.565	Port Hedland
VK6RTT	144.600	Carnarvon
VK5VF	144.800	Mount Lofty
VK2RCW	144.950	Sydney
VK3RCW	144.950	Melbourne
VK6RPH	145.000	Perth
VK6RBS	432.066	Busselton
VK6RPR	432.160	Nedlands
VK1RBC	432.410	Canberra
VK6RTT	432.410	Wickham
VK2RSY	432.420	Sydney
VK3RTG	432.430	Melbourne
VK3RMV	432.435	Hamilton

Continued next page

VK4R	432.440	Brisbane
VK4RIK	432.445	Cairns
VK4RTL	432.445	Townsville
VK3RAI	432.450	Melbourne
VK6RTW	432.465	Albany
VK3RGG	432.530	Geelong
VK3RMB	432.535	Ballarat
VK4RAR	432.545	Rockhampton
VK6RPB	432.565	South Headland
VK6RPB	576.753	South Headland
VK6RBS	1296.198	Busselton
VK1RBC	1296.410	Canberra
VK2RSY	1296.420	Sydney
VK4RSD	1296.440	Brisbane
VK4RIK	1296.445	Cairns
VK6RPR	1296.480	Nedlands
VK6RPB	1296.695	South Hedland
VK2RSY	2304.420	Dural
VK4RIK	2304.445	Cairns
VK4RSD	2306.440	Brisbane
VK6RVF	10300.000	Roleystone
VK3RGZ	10368.00	Melbourne
VK4RIK	10445.000	Cairns
Selected Pacific Region Beacons		
H44HIR	50.005	Honiara
KH6JJK	50.080	Hawaii
JG1ZGW	50.490	Japan
P29BPL	52.013	P.N.G
ZK2SIX	52.100	Niue

AERONAUTICAL BEACONS USEFUL FOR PROPAGATION TESTS

VK1	Canberra	NDB	263 khz	CB
		VOR.	116.7 MHz	
VK2	Sydney	NDB	317 kHz	SY
		VOR	115.4 MHz	
	Lord H. Is	NDB	272 kHz	LH
VK3	Melb	NDB	344 kHz	LV
		VOR	114.1	ML
VK4	Brisbane	NDB	302 kHz	BN
		VOR	113.2 MHZ	
	Cairns	NDB	364 kHz	
VK5	Adelaide	NDB	362 kHz	AD
		VOR	116.4 MHz	
VK6	Perth	NDB	400 kHz	PH
		VOR	113.7 MHz	
	Pt Hedland	NOB	260 kHz	PD
		VOR	114.1 MHz	
VK7	St Helens	NDB	392 kHz	STH
	Strahan	NDB	257 kHz	SRN
	Hobart	VOR	112.7 MHz	
VK8	Alice Sps.	NDB	224 kHz	AS
		VOR	115.9 MHz	
	Darwin	NDB	344 kHz	DN
		VOR	1124 MHz	
VK9	Cocos Is.	NDB	305 kHz	CC
	Norfolk Is.	NDB	260 kHz	NF
	Christmas Is.	NDB	341 kHz	XMX

Name	Site	Output Freq.	Height mASL	EIRP
Christchurch 725	Herbert Peak	147.250	926	20
Tekapo 680	Mount Rollesby	146.800	1341	20
Timaru 6625		146.625	332	15
Waimate 695	Mount Studholme	146.950	1088	20
Oamaru 670	Station Peak	146.700	886	20
Alexandra700	Fruitlands	147.000	1478	15
Queenstown 685	Double Cone	146.850	2286	22
Dunedin 665		146.650	310	
Dunedin 690	Mount Cargill	146.900	674	25
Balclutha 675	Kuriwao	146.760	638	20
Gore 695	McLeod's Hill	146.950	640	100
Invercargill 680	Bald Hill, Otautau	146.800	798	15

SEVENTY CENTIMETRE BAND—FM REPEATERS

Name	Site	Output Freq.	Height mASL	EIRP
Auckland 850	Mt Eden	438.500	200	25
Auckland 900	Port Waikato	439.000	403	1000
Hunua 895	Clements Hill	438.950	300	10
Waikato 860	Mount Te Aroha	438.600	944	70
Tauranga 885	Mt Minden, Te Puna	438.850	280	10
Tokoroa 865	Whakamaru	438.650	793	50
Waitomo 870		438.700	869	
Rotorua 855	Mount Ngongotaha	438.550	757	10
Egmont 4025	East Mount Egmont	434.025	1509	100
Waimarino 875	Turoa Skifield	438.750	2050	125
Hawkes Bay 900		439.000	793	250
Hawkes Bay 870	Peak House	438.700	389	20
Marton 865		438.650		
Manawatu 8525		438.525	488	
Kapiti 885	Paraparaumu Beach	438.850	30	100
Climie 860	Mount Climie	438.600	867	100
Tawa 895	Tawa	438.950	70	150
Wellington 850	Mount Victoria	438.500	195	40
Wellington 900	Mount Belmont	439.000	450	150
Blue Duck 3975	Blue Duck	433.975	1021	
Christchurch 900	Marley Hill	439.000	488	
Hornby 850	Cass Peak	438.500	522	25
Dunedin 850	Mount Cargill	438.500	674	8
Invercargill 870	Invercargill City	438.700	45	5

Split — 5 MHz, except for Egmont and Blue Duck link repeaters which are +5 MHz.
ATV repeater input 443.25 MHz vision, 449.75 MHz sound, output 615.25 MHz vision, 620.75 sound.

TWENTY-THREE CENTIMETRE BAND—FM REPEATERS

Name	Site	Input Freq.	Output Freq.	Height mASL	EIRP
Wellington 120		1291.200	1271.200	100	

DATA REPEATERS

Name	Site	Input Freq.	Output Freq.	Height mASL	EIRP
Pukoti Data	Manginangina	146.175	146.775	378	10
Whangarei Data	Parakiore	146.075	146.650	392	25
Waitomo Data		147.825	147.225	869	
Hawkes Bay AX.25		144.600	144.600	792	
Manawatu Data	Pahiatua Track	144.600	145.725	488	8
Wellington Data	Hawkins Hills	146.025	146.625	533	100
Christchurch AX.25	Marley Hill	144.650	144.650	488	

TELEVISION, AM AND LINEAR REPEATERS

Name	Site	Input Freq.	Output Freq.	Height mASL	EIRP
Auckland ATV	(Temporary)	615.250	1000		
Rotorua Linear		144.950	144.350	685	
Wellington ATV	Mt Belmont		615.250	450	500
Dunedin Linear	Highcliff	144.950	144.350	210	2
Invercargill AM	Bluff Hill	144.650	145.775	265	15

Wicen Co-ordinators

Fed	Ron Henderson 171 Kingsford Smith Dr Melba ACT 2615	VK1RH	062 58 7904 h 062 65 5550 w
VK1	Richard Elliott 93 Shackleton Cir Mawson ACT 2607	VK1ZAH	062 86 2736 h 062 68 7233 w
VK2	Steven Boyd 4 Wisdon St Annandale NSW 2038	VK2DNN	02 660 4783 h 02 265 8909 w
VK3	Leigh Baker 552 Canterbury Rd Vermont Vic 3133	VK3CDP	03 873 3417 h 03 603 5555 w
VK4	Ken Ayers 142 Castlehill Dr Nerang Qld 4211	VK4KD	075 58 2293 h
VK5	Graham Iles 78 Mawson Rd Meadows SA 5201	VK5AT	08 388 3458
VK6	Arthur Baxter 12 Caroline Green Marangaroo WA 6064	VK6NBG	09 342 5002 h
VK7	Norm Thorley Box 326 Ilfraville Tas 7270	VK7KTN	003 83 4129 h
VK8	Trevor Connell Box 40441 Casuarina NT 0810	VK8CO	089 27 9256 h 089 20 4431 w

EMERGENCY

First aid in case of shock.
Ref.P.112 (last page) 1988 Call book.

Police

ACT VK1	(062)	45 7377/45 7444
NSW VK2	(02)	2 0960/ 2 0966
VIC VK3	(03)	11 444
QLD VK4	(07)	226 6001
SA VK5	(08)	11 444/223 0223
WA VK6	(09)	421 8222 325 0121
TAS VK7	(002)	38 1101
NT VK8	(089)	27 8888/81 5555

Ambulance

ACT VK1	(062)	49 8133
NSW VK2	(02)	2 0920
VIC VK3	(03)	11 441
QLD VK4	(07)	839 2222
SA VK5	(08)	272 8822 223 2044
WA VK6	(09)	277 8899
TAS VK7	(002)	34 3131
NT VK8	(089)	27 9000

All emergency services, all states, Dial 000.
Federal Sea Safety and Surveillance Centre
(062) 47 6666/47 5244
Natural Disasters Organisation
(062) 46 6600
(charges can be reversed)

Wireless Institute Civil Emergency Network (WICEN)

Primary	Secondary Frequencies
3.600 MHz	(+25 kHz S S B
7.075	-25 kHz C W)
14.125	
21.190	
28.450	

Wicen Nets

VK1	None		
VK2	THU	1100Z	7150 repeater
VK3	SUN	1030Z	3.600 MHz
VK4	SUN	2230Z	7.075 MHz
(as required Brisbane Stormwatch 7000 repeater)			
VK5	WED	1000Z	(+30 summer time) 7000 repeater
		1000Z	(+1h summer tim) 3.600 MHz
VK6	WED	1200z	3.600 Mhz
VK7	None		
VK8	Refer VK5.		

AUSTRALIAN AMATEUR REPEATERS

Listing of Repeaters by Frequency

Callsign	Frequency (MHZ) OutPut	Input	Time Out (min)	Mode	Site	Elevation M	Service Area
VK6RHF	29.630	29.530		Voice	Darling Scarp		Perth
VK3RHF	29.640	29.540		Voice	Mt Dandenong		Melbourne
VK3RMH	53.550	52.550			Wattle Glen		Melbourne
VK2RSN	53.625	52.625		Voice	Mt Sugarloaf		Newcastle
VK3RTN	53.675	53.075	5.0	Voice	Lake Mountain	1500	Melbourne
VK4RGA	53.725	52.725		Voice	Amys Peak	920	Central Queensland
VK4RIK	53.725	53.125		Voice	Mt Haren	480	Cairns
VK6RTH	53.800	52.800		Voice	Tic Hill		Perth
VK2RWI	53.850	52.850	3.5	Voice	Dural	240	Sydney
VK3RMS	53.900	53.300	2.5	Voice	Mt Dandenong		Melbourne
VK1RGI	144.800	144.800		Packet	Mt Ginini	1770	ACT & SE NSW
VK2RMB	144.800	144.800		Packet	Terrey Hills	150	Sydney
VK3RPK	144.800	144.800		Packet			Melbourne
VK2RWI	144.850	144.850	0.5	Packet	Dural	240	Sydney
VK4RZB	144.850	144.850		Packet	Constitution Hill	230	Brisbane
VK2RPH	144.900	144.900		Packet	Hornsby	200	Sydney
VK3RPP	144.900	144.900		Packet	Lysterfield		Melbourne
VK4RAR	144.900	144.900		Packet	Mt Archer	600	Rockhampton
VK4RBS	144.900	144.900		Packet	Mt Goonaneman	650	Bundaberg
VK4RZC	144.900	144.900		Packet	Wilkes Knob	470	Sunshine Coast
VK2RPL	145.050	145.050		Packet	Mt Nardi	800	Lismore
VK4RBT	145.050	145.050		Packet	Mt Cotton	233	Brisbane
VK2RBB	146.625	146.025	3.0	Voice	Byron Bay	150	Lismore, Casino
VK2RLD	146.625	146.025	4.5	Voice	Razorback Range	330	Sydney
VK4RGT	146.625	146.025		Voice	Mt Maurice	225	Gladstone
VK7RAD	146.625	146.025	5.0	Rt/Data	Mt Duncan	600	Tasmania
VK2RCH	146.650	146050	3.0	Voice	Bruxner Park	300	Coffs Harbour
VK2RDX	146.650	146.050	3.5	Voice	Mt Bindo—Oberon	1362	Western Blue Mts
VK2RMI	146.650	146.050	4.0	Voice	Terry Hi Hi	660	Moree/Inverell
VK3REG	146.650	146.050	2.5	Voice	Donalds Knob	560	East Gippsland
VK3RGV	146.650	146.050	3.5	Voice	Mt Wombat	800	Shepparton
VK4ROM	146.650	146.050		Voice	Grafton Range	550	Roma
VK5RNC	146.650	146.050		Voice	Naracoorte		Naracoorte
VK6RSW	146.650	146.050	5.0	Voice	Bunbury	20	Bunbury
VK8RMS	146.650	146.050		Voice	Gove		Gove
VK2RTY	146.675	146.075		RTTY	Blacktown	72	Sydney
VK4RTA	146.675	146.075		Voice	Longland Gap	1170	Atherton
VK4R	146.675	146.075		Voice	Mt Kiangrow	1140	
VK5RSV	146.675	146.075		RTTY	Willunga Hill		McLaren Vale
VK6RCA	146.675	146.075		Voice	Carnarvon		Carnarvon
VK2RAO	146.700	146.100	3.0	Voice	Mt Canobolas	1417	Orange
VK2RMU	146.700	146.100	2.5	Voice	Milton	152	Ulladulla
VK2RPM	146.700	146.100	3.5	Voice	Middle Brother Mtn	552	Taree
VK3RML	146.700	146.100	2.5	Voice	Mt Dandenong	600	Melbourne
VK3RNC	146.700	146.100	2.5	Voice	Mt Mitta Mitta		Corryong
VK3RON	146.700	146.100	2.5	Voice	Ouyen		Ouyen
VK4RAR	146.700	146.100	4.0	Voice	Mt Archer	608	Rockhampton
VK4RAT	146.700	146.100	4.5	Voice	Mt Stuart	584	Townsville
VK4RGC	146.700	146.100		Voice	Springbrook	500	Gold Coast
VK4RMI	146.700	146.100	3.5	Voice	Four Mile Hill	500	Mt Isa
VK5RMN	146.700	146.100	5.0	Voice	The Bluff	730	Port Pirie
VK6RAP	146.700	146.100	3.0	Voice	Roleystone	360	Perth

VK6RKI	146.700	146.100		Voice	Koolan Island		Koolan Island
VK6RWH	146.700	146.100		Voice	Derby		Derby
VK6RWR	146.700	146.100		Voice	Wickham		Wickham
VK7RHT	146.700	146.100	2.5	Voice	Mt Wellington	1310	Hobart
VK8RDA	146.700	146.100		Voice	Karama		Darwin
VK2RAG	146.725	146.125	3.0	Voice	Somersby	318	Gosford/Wyong
VK4RSB	146.725	146.125		Voice	Mt Gordon	20	Bowen
VK6RAL	146.725	146.125		Voice	Albany		Albany
VK2RFS	146.750	146.150	3.5	Voice	Mt Mumbulla	870	Bega
VK2RTM	146.750	146.150	3.0	Voice	Mt Crawney	1430	Tamworth
VK2RWG	146.750	146.150	3.0	Voice	Mt Flackney	490	Wagga
VK3RBA	146.750	146.150	3.0	Voice	Mt Buninyong	750	Ballarat
VK4RDD	146.750	146.150	4.5	Voice	Mt Lofty	715	Toowoomba
VK6RLM	146.750	146.150	2.0	Voice	Lesmurdie		Perth
VK7RNW	146.750	146.150	5.0	Voice	Ulverstone	160	Tasmania
VK2RTZ	146.775	146.175	3.0	Voice	Sugarloaf Range	400	Lake Macquarie
VK2RCC	146.800	146.200	3.5	Voice	Needle Mountain	1100	Coonabarabran
VK2RIC	146.800	146.200	3.0	Voice	Parrots Nest	85	Lismore, Casino
VK2RLE	146.800	146.200	3.5	Voice	Heathcote	240	Sydney
VK2RTD	146.800	146.200	4.0	Voice	Mt Kendall	930	Tumut
VK3RLV	146.800	146.200	2.5	Voice	Mt Tassie	730	Latrobe Valley
VK3RMA	146.800	146.200	2.5	Voice	Mildura	50	Mildura
VK4RBU	146.800	146.200	4.0	Voice	Mt Goonaneman	620	Bundaberg
VK5REP	146.800	146.200		Voice	Coolanie		Eyre Peninsula
VK6RTH	146.800	146.200	5.0	Voice	Tic Hill	230	Perth
VK6RWP	146.800	146.200		Voice	Karratha		Karratha
VK2RGN	146.825	146.225		Voice	Mt Gray	750	Goulburn
VK4RDT	146.825	146.225		Voice	Gabbinbah	723	Toowoomba
VK6RAA	146.825	146.225	3.0	Voice	Mt Barker	430	Albany
VK2RAB	146.850	146.250	4.0	Voice	Porcupine Res	440	Gunnedah
VK2RAW	146.850	146.250	4.0	Voice	Mt Murray	769	Wollongong
VK2RGF	146.850	146.250	2.5	Voice	Mt Bingar	450	Griffith
VK4RSC	146.850	146.250		Voice	Buderim	450	Sunshine Coast
VK5RHO	146.850	146.250	3.5	Voice	Houghton	410	Adelaide
VK6REX	146.850	146.250		Voice	Tower Zero		Exmouth
VK6RKB	146.850	146.250		Voice	Kambalda		Kambalda
VK2RMB	146.875	146.275	3.0	Voice	Terrey Hills	150	Sydney
VK4RCH	146.875	146.275		Voice	Red Hill	340	Chinchilla
VK1RAC	146.900	146.300	4.0	Voice	Black Hill	870	Canberra
VK2RAN	146.900	146.300	5.0	Voice	Mt Sugarloaf	300	Newcastle-Lwr Hunter
VK2RRT	146.900	146.300	5.0	Voice	Boona Mount	441	Condobolin
VK3RBS	146.900	146.300	2.5	Voice	Smeatons Hill		Ballarat
VK3REB	146.900	146.300	2.5	Voice	Nungurner		Bairnsdale
VK3RSH	146.900	146.300	2.5	Voice	Swan Hill	60	Swan Hill
VK4RAI	146.900	146.300	4.5	Voice	Mt Stradbroke	120	Ipswich
VK4RGA	146.900	146.300	4.0	Voice	Amys Peak	920	Gladstone
VK5RMG	146.900	146.300	5.0	Voice	Mt Gambier	100	Mt Gambier
VK6RBY	146.900	146.300	5.0	Voice	Mt William	520	Bunbury
VK6RMN	146.900	146.300		Voice	Mt Newman		Mt Newman
VK7REC	146.900	146.300	2.5	Voice	Snow Hill	970	Eastern Tasmania
VK2RGR	146.925	146.325	2.5	Voice	North Ryde	30	Sydney
VK4RRC	146.925	146.325		Voice	Mt Mee	520	Redcliffe
VK1RGI	146.950	146.350	3.0	Voice	Mt Ginini	1770	ACT & SW NSW
VK2RNE	146.950	146.350	4.0	Voice	Mt Rumbee	1503	Glen Innes
VK3RWZ	146.950	146.350	2.5	Voice	Mt William	1170	Grampians
VK4RCA	146.950	146.350	4.0	Voice	Mt Bellenden Ker	1650	Cairns
VK6RPD	146.950	146.350	3.0	Voice	Bentley	70	Perth
VK6RSG	146.950	146.350		Voice	Shay Gap		Shay Gap
VK2RAN	146.975	146.375	5.0	RTTY/VO	Mt Sugarloaf	300	Newcastle
VK4RRR	146.975	146.375		Voice	Blue Mtn NEBO	600	Sarina (linked to VK4RHR 8500)
VK6REE	146.975	146.375		Voice	Portable		WICEN
VK2RWI	147.000	146.400	3.5	Voice	Dural	240	Sydney
VK3RGL	147.000	146.000	2.5	Voice	Mt Anakie	400	Geelong
VK3RNE	147.000	146.400	2.5	Voice	Mt Big Ben	1158	Wodonga

VK4RBN	147.000	146.400	2.0	Voice	Mt Glorious	630	Brisbane
VK4RMK	147.000	146.400	5.0	Voice	Black Mountain	60	Mackay
VK5RAD	147.000	146.400	3.5	Voice	Crafers	610	Adelaide
VK6RAK	147.000	146.400	5.0	Voice	Kalgoorlie	400	Kalgoorlie
VK6RAW	147.000	146.400	5.0	Voice	Mt Lathan	400	Wagin
VK6REE	147.000	146.400		Voice	Portable		WICEN
VK6RGN	147.000	146.400	5.0	Voice	Geraldton	400	Geraldton
VK6RNW	147.000	146.000		Voice	Port Hedland		Port Hedland
VK7RAA	147.000	146.400	5.0	Voice	Mt Barrow	1400	NE Tasmania
VK8RCA	147.000	146.400	3.5	Voice	Alice Springs		Alice Springs
VK8RTE	147.000	146.400		Voice	Palmerston		Darwin
VK2ROT	147.025	147.625	3.0	Voice	Paddington	90	Sydney
VK3RGS	147.025	147.625	2.5	Voice	Mt Fatigue		Toora
VK2RBM	147.050	147.650	3.5	Voice	Mt Druitt	20	Blue Mtns/Nepean
VK3RVL	147.050	147.650	2.5	Voice	Robinvale		Robinvale
VK3RWL	147.050	147.650	2.5	Voice	Mt Warrnambool		Warrnambool
VK6RTY	147.050	147.650		RTTY	Roleystone		Perth
VK3RCR	147.075	147.675		Voice	Montrose		Melbourne
VK2RWM	147.100	147.000	3.0	Voice	Grenfell	575	Grenfell
VK2RZL	147.100	147.000	3.0	Voice	Mt Arthur	800	Upper Hunter
VK3RPB	147.100	147.700	2.5	Voice	Mt Porepunkah		Bright
VK3RSG	147.100	147.700	3.0	Voice	Bass Hill		South Gippsland
VK4RGY	147.100	147.100	4.0	Voice	Mt Boulder	496	Gympie
VK6RWC	147.100	147.700	5.0	Voice	Lesmurdie		Perth
VK2R	147.125	147.725		Voice	Portable		WICEN
VK3RGC	147.125	147.725	2.5	Voice	Montpellier		Geelong
VK2RWS	147.150	147.750		Voice	Chatswood	140	Sydney
VK3RCV	147.150	147.750	3.0	Voice	Mt Alexander	730	Bendigo
VK4RAG	147.150	147.750	3.5	Voice	Spring Hill	90	Brisbane
VK4RWI	147.150	147.750		Voice	Portable		WICEN
VK2R	147.175	147.775		Voice	Portable		WICEN
VK3REC	147.175	147.775	2.5	Voice	Mt Dandenong	600	Melbourne
VK6RIC	147.175	147.775		Voice	Portable		WICEN
VK2RSD	147.200	147.800	4.0	Voice	Mt Cambewarra	600	Nowra
VK6RCT	147.200	147.800		Voice	Cataby		Cataby
VK2RST	147.225	147.825	4.0	SSTV/Vo	Lane Cove	25	Sydney
VK3RWG	147.225	147.825	2.5	Voice	Mt Baw Baw		West Gippsland
VK2RNS	147.250	147.850	3.5	Voice	Asquith	225	Sydney
VK3RMM	147.250	147.850	2.5	WICEN	Mt Macedon	1011	Melbourne
VK6RMS	147.250	147.850		Voice	Mt Saddleback		Boddington
VK7RAF	147.250	147.850		Multi			Hobart
VK2RIL	147.275	147.875	4.0	RTTY/Vo	Sublime Point	398	Wollongong
VK3ROW	147.275	147.875		Voice	Otway Ranges		Colac
VK2RTS	147.300	147.900	3.0	Voice	Lower Blue Mtns	370	Sydney
VK3RWP	147.300	147.900		Voice	Portable		WICEN
VK4RQT	147.300	147.900	3.5	Voice	Mt Glorious	630	Brisbane
VK6REN	147.300	147.900		Voice	Ocean Hill		Eneabba
VK2RHR	147.350	147.950	3.0	Voice	Mt Gibraltar	862	Southern Highlands
VK3RTY	147.350	147.950	10.0	RTTY	Mt Dandenong	600	Melbourne
VK6RBN	147.350	147.950		Voice	Busselton		Busselton
VK2RAO	147.525	147.525	0.5	Packet	Mt Canobolas	1417	Orange
VK2RPT	147.525	147.525	5.0	Packet	Mt Tumorroma	1231	Tumut
VK3RBB	147.525	147.525		Packet	Mt Tassie		Gippsland
VK3RMC	147.550	147.550		RTTY/BB	Lilydale		Melbourne
VK2RAW	147.575	147.575	1.0	Packet	Mt Murray	769	Wollongong
VK2RCH	147.575	147.575		Packet	Bruxner Park		Coffs Harbour
VK2RPL	147.575	147.575	3.0	Packet	Mt Nardi	85	Lismore
VK2RPM	147.575	147.575		Packet	Taree	552	Port Macquarie
VK2RPN	147.575	147.575		Packet	Sugarloaf Range	400	Lake Macquarie
VK2RPS	147.575	147.575		Packet	High Range	827	Southern Highlands
VK2RPW	147.575	147.575		Packet	Grundys Mt		Tamworth
VK2RSD	147.575	147.575		Packet	Mt Cambewarra	600	Nowra
VK3RGV	147.575	147.575		Packet	Mt Wombat		Shepparton
VK3RMU	147.575	147.575		Packet	Mt St Leonards		Melbourne
VK3RNU	147.575	147.575		Packet	Mt Stanley		Wodonga

VK3RPA	147.575	147.575		Packet	St Albans		Melbourne
VK6R	147.575	147.575		Packet			Perth
VK2RAG	147.600	147.600	3.0	Packet	Somersby	313	Gosford/Wyong
VK3RPA	147.600	147.600		Packet	St Albans		Melbourne
VK3RPK	147.600	147.600		Packet	Broadmeadows		Melbourne
VK4RZA	147.600	147.600		Packet	Springbrook	940	Gold Coast
VK4RZB	147.600	147.600		Packet	Constitution Hill	230	Brisbane
VK4RZC	147.600	147.600		Packet	Wilkes Knob	470	Sunshine Coast
VK4RZD	147.600	147.600		Packet	Mt Perseverance	700	Toowoomba
VK4RBT	147.650	147.050		RTTY/Vo	Mt Cotton	233	Brisbane
VK4RBT	147.675	147.075	4.5	RTTY/Vo	Mt Cotton	233	Brisbane
VK4REG	147.825	147.225		Voice	Manly West	50	Brisbane
VK4RII	147.950	147.350		Voice	Mt Inkerman	218	Burdekin
VK7RTV	426.250	444.250		ATV	Mt Duncan		NW Tasmania
VK2RTK	438.025	433.025	2.0	Voice	High Range	827	Southern Highlands
VK4RTQ	438.025	433.025		Voice	Mt Tamborine		Brisbane
VK2RAG	438.075	433.075	3.0	Voice	Somersby	323	Gosford/Wyong
VK3RMU	438.075	433.075	2.5	Voice	Mt St Leonards		Melbourne
VK4RSC	438.075	433.075		Voice	Buderim	450	Sunshine Coast
VK2RMB	438.175	433.175	3.0	Voice	Terrey Hills	150	Sydney
VK2RNT	438.175	433.175	3.0	Voice	Armidale		Armidale
VK3RUG	438.175	433.175		Voice	Devils River		Alexandra
VK2RUW	438.225	433.225	4.0	Voice	Port Kembla	100	Wollongong
VK3ROU	438.225	433.225	2.5	Voice	Mt Dandenong	600	Melbourne
VK4RAT	438.225	433.225		Voice	Mt Stuart	584	Townsville
VK4RGC	438.225	433.225	3.5	Voice	Springbrook	500	Gold Coast
VK6RTH	438.225	433.225		Voice	Tic Hill		Perth
VK2RWS	438.275	433.275		Voice	Chatswood	140	Sydney
VK3RWE	438.275	433.275		Voice	Portable		WICEN
VK2REE	438.325	433.325	3.0	Voice	Mount Marie	930	Taree
VK2RWM	438.325	433.325	3.0	Voice	Grenfell	575	Grenfell
VK1RIR	438.375	433.375	3.5	Voice	Isaacs Ridge	790	Canberra
VK2RUT	438.375	433.375	3.0	Voice	Kurrajong	500	Blue Mountains
VK3RGU	438.375	433.375	4.0	Voice	Carrajung		Gippsland
VK4RWM	438.375	433.375		Voice	Ipswich	60	Ipswich
VK2RUH	438.425	433.425	4.0	Voice	Hurstville	100	Sydney South
VK4RMU	438.425	433.425		Voice	Boveys Lookout	50	Mackay
VK5RBV	438.425	433.425		Voice	Angaston		Barossa Valley
VK2RRS	438.475	433.475	4.0	Voice	Chatswood	50	Sydney
VK4RHR	438.500	433.500		Voice	Drummond Range	520	Clermont (linked to VK4RRR 6975)
VK7RIN	438.500	433.500		Voice	Barren Tier		
VK1RGI	438.525	433.525	3.5	Voice	Mt Ginini	1770	ACT & SE NSW
VK2RPM	438.525	433.525	3.0	Voice	Taree	552	Port Macquarie
VK2RWI	438.525	433.525	3.5	Voice	Dural	240	Sydney
VK3RAD	438.525	433.525	2.5	Voice	Mitcham	100	Melbourne
VK3RNU	438.525	433.525	2,5	Voice	Mt Stanley	1051	Wangaratta
VK3RRU	438.525	433.525	2.5	Voice	Merbein		Mildura
VK4RBC	438.525	433.525	2.0	Voice	Mt Coottha	560	Brisbane
VK5RVP	438.525	433.525		Voice	Crafers		Adelaide
VK6RUF	438.525	433.525		Voice	Roleystone		Perth
VK7RIT	438.525	433.525		Voice	Sandy Bay		Hobart
VK7RAB	438.550	433.550	3.0	Voice	Mt Arthur	1190	NE Tasmania
VK7RTC	438.600	433.600		Voice	Mt Nelson		Hobart
VK2RUM	438.625	433.625	3.0	Voice	New Lambton	50	Newcastle
VK3RWI	438.625	433.625		Voice	Portable		WICEN
VK4RAG	438.625	433.625		Voice	Spring Hill	90	Brisbane
VK4RWI	438.625	433.625		Voice	Portable		WICEN
VK7RAC	438.650	433.650		Voice	Table Cape		NW Tasmania
VK2RAN	438.675	433.675	5.0	Voice	Mt Suglarloaf	300	Newcastle
VK2RSC	438.675	433.675	3.0	Voice	Mt Nardi	100	Lismore Casino
VK2RTW	438.675	433.675		Voice	Willans Hill		Wagga
VK3RWU	438.675	433.675	3.0	Voice	Mt William	1170	Grampians
VK4RBU	438.675	433.675		Voice	Mt Goonaneman	620	Bundaberg
VK6RBN	438.675	433.675		Voice	Busselton		Busselton

VK4RDB	438.700	433.700	5.0	Voice	Mt Mowbullan	1000	Darling Downs
VK2RIL	438.725	433.725	4.0	RTTY/Vo	Sublime Point	398	Wollongong
VK4RGY	438.825	433.825		Voice	Mt Boulder	496	Gympie
VK2RPL	438.875	438.875	3.0	Packet	Mt Nardi	85	Lismore
VK4RBA	438.950	433.950		Voice	Redbank Plains	180	Redbank
VK3RMM	439.275	434.275	3.0	Voice	Mt Macedon	1011	WICEN
VK4RDU	439.275	434.275		Voice	Picnic Point	710	Toowoomba
VK4RIK	439.350	434.350		Voice	Mt Haren	480	Cairns
VK3RDU	439.425	434.425	2.5	Voice	Chessney Vale		Benalla
VK3RGL	439.575	434.575	2.5	Voice	Mt Anakie	400	Geelong
VK3RPU	439.725	434.725	2.5	Voice	Arthurs Seat		Melbourne
VK5RCN	444.250	426.250		ATV	Barunga Range		Clare Valley
VK2RTG	579.250	444.250		ATV	Kariong	200	Gosford/Wyong
VK2RTN	579.250	426.250		ATV	Newcastle		Newcastle
VK2RTS	579.250	426.250	3.0	ATV	Lower Blue Mtns	370	Sydney
VK2RTV	579.250	426.250		ATV	Chatswood		Sydney
VK2RTW	579.250	444.250	30.0	ATV	Willans Hill	300	Wagga
VK3RMZ	579.250	426.250		ATV	Bendigo		Bendigo
VK3RTV	579.250	444.250		ATV	Mt Dandenong	600	Melbourne
VK4RAT	579.250	426.250		ATV	Mt Stuart	584	Townsville
VK4RTV	579.250	444.250		ATV	Springhill	140	Brisbane
VK5RTV	579.250	426.250		ATV	O'Halloran Hill		Adelaide
VK7RAE	579.250	444.250		ATV	Kelceystier		Devonport
VK2RTS	584.750	431.750	3.0	ATV Snd	Lower Blue Mtns	370	Sydney
VK5RWH	1246.250	444.250		ATV	Willunga Hill		McLaren Vale
VK3RMU	1253.500	1241.500		Voice	Mt St Leonard		Melbourne
VK5ROH	1253.850	1241.850		Voice	Willunga Hill		McLaren Vale
VK4REX	1281.650	1293.650	4.0	Voice	Brisbane City	100	Brisbane

THE SCOUT ASSOCIATION OF AUSTRALIA

Jamboree — On — The — Air

General:

Jamboree—on—the—Air is one week—end every year when Scouts (with Guides now invited) talk by courtesy of Amateur Radio to other Scouts and Guides overseas, in other states, to our country areas or "just over the back fence".

It teaches the meaning of the "brotherhood and sisterhood" of Scouting and Guiding, demonstrates the International aspect of the movements, introduces young people to electronics and shows the necessity for correct communication procedures (phonetics, overs — not like a telephone). In some stations high levels of co-operation and organization are evidenced and there can be opportunities for Scouts and Guides to put other aspects of their training to practical use (pioneering, communicating, catering). IN the process it is fun and young people learn of programmes and activities of others and tolerance and understanding of other races.

The first JOTA was in May 1958 following a meeting of Scouter Amateurs at the Jubilee Jamboree at Sutton Coldfield, UK, in 1957 at which they agreed to meet each other "on air in 12 months time".

It has become the largest event in the international calendars of Scouting, Guiding and Amateur Radio with 300,000 participants in 100 countries. Australia has close to 600 stations on air during the week—end.

For the first few years various dates were selected and inevitably they clashed with an Amateur Contest. To avoid this conflict the International Amateur Radio Union and World Scout Bureau agreed on the third full week-end in October for JOTA each year. For simplicity and to allow flexibility of operation the times agreed are all Saturday and Sunday LOCAL TIME everywhere so that for 24 hours all stations around the world could be operating.

To facilitate contacts a set of World Scout Calling Frequencies was chosen and, for various reasons, modified or extended for Australia:

World Scout Calling Frequencies

Band	CW	DX Phone	VK Phone
80 metres	3.590 MHz	3.740 MHz	3.590 MHz
40 metres	7.030 MHz	7.090 MHz	7.090 MHz
20 metres	14.070 MHz	14.290 MHz	14.190 MHz
15 metres	21.140 MHz	21.360 MHz	21.190 MHz
10 metres	28.190 MHz	28.990 MHz	28.390 MHz

Callsigns:

Because of the growing popularity of JOTA and electronics the 2nd National JOTA Conference of Scout Branch JOTA Organizers and State Liaison Guiders in Brisbane in 1983 decided to apply to the Department of Communications (now DOTC) for a special range of callsigns VKxSAA to VKxSDZ and VKxGGA to VKxGGZ for Scout and Guide stations. The Department accepted the idea and agreed that Organizers in each State would pre-allocate callsigns and keep a register. Many of these can now be found in the Callbook and the letters have special significance to the Stations involved.

Scout Nets:

Many years ago the then National Co-ordinator Noel Lynch VK4BNL started host-

ing regular nets on Sundays.

An Australian Scout Net on the first Sunday each month at different times operated on 7.090 MHz, 21.190 MHz and 14.190 MHz for any station "with Scout affiliation" — own station or callsign, or an operator for or interested in Scout Radio. Many ex Scouts now Amateurs also called in.

A JOTA net for Branch Organizers was conducted on the third Sunday. Many questions were answered and much JOTA information was disseminated in these nets.

When Noel stepped down from that position he was asked to continue hosting these nets and continued until early 1988. The 20 metre segments are continuing and other possibilities will be discussed at the 4th National JOTA Conference in Adelaide in January 1989.

The Australian Scout Net is run by National Co-ordinator for JOTA Peter Hughes VK6HU on 14.190 MHz (+/- QRM) on the First Sunday morning of each month at 0215Z (or as soon as possible after the VK6 WIA news).

The JOTA Organizers Net is run at the same time and frequency on the Third Sundays — but all are welcome.

Most other Sunday mornings (pm eastern seaboard, no change for daylight saving) some enthusiasts have a regular sked on the net time and frequency. **ar**

14 MHZ BEACONS

This series is sponsored by the Northern Californian DX Foundation. The beacons all operate in turn on the one frequency of 14.100 MHz. The series starts on the hour. They send the following series of signals at the power indicated:

QST de (call sign)	100W
.—	100W
..—	10W
...—	1W
....—	0.1W
sk de (call)	100W

The call sequence is as follows:

T+0 min	4U1UN/B	New York
T+1	W6WX/B	Stanford
T+2	KH6O/B	Honolulu
T+3	JA21GY/B	Ise City
T+4	4X6TU/B	Tel Aviv
T+5	OH2B	Espoo
T+6	CT3B	Funchal
T+7	ZS6DN/B	Pretoria
T+8	LU4AA	Santa Cruz
T+9	HK4LR/B	Colombia

NEW ZEALAND BEACONS

Name	Site	Call	Freq. MHZ	Mode mASL	Height	EIRP
Upper Hutt 10m	Mount Climie	ZL2MHF	28.230	F1	867	1
Auckland 6 m	Nihotupu	ZL1UHF	51.020	F1	330	25
Hawkes Bay 6m	Napier	ZL2MHB	51.030	F2	3	10
Taranaki 6m	Inglewood	ZL2VHT	51.225	F2	239	30
Manawatu 6m	Pahiatua Track	ZL2VHM	52.250	F1	488	8
Upper Hutt 6m	Mount Climie	ZL2MHF	52.510	F1	867	4
Blenheim 6m	Blenheim	ZL2SIX	52.490	F1	60	10
Christchurch West 6m	Aylesbury	ZL3MHF	52.310	F1	11	50
Auckland 2m	Mount Otau	ZL1VHF	145.100	A1	337	10
Waikato 2m	Hamilton	ZL1VHW	145.150	F1	97	10
Rotorua 2m	Kakanui	ZL1VHR	145.175	A1	504	6
Hawkes Bay 2m	Napier	ZL2MHB	145.240	F2	3	10/1/0.1
Taranaki 2m	Inglewood	ZL2VHT	145.225	F1	239	20
Wellington 2m	Hawkins Hill	ZL2UHF	145.200	F1	533	20
Takaka 2m	Takaka Hill	ZL2VHN	145.280	A3	915	2
Christchurch 2m	Christchurch	ZL3VHF	145.300	F1	30	30
Dunedin 2m	Rotary Park	ZL4VHF	145.400	F1	160	20
Invercargill 2m	Southland Hospital	ZL4VHI	145.425	A1	25	5
Auckland 70cm	Nihotupu	ZL1UHF	433.100	F1	330	20
Waikato 70cm	Hamilton	ZL1VHW	433.150	F1	97	20
Hawkes Bay 70cm	Napier	ZL2MHB	433.240	F2	3	5
Taranaki 70cm	Inglewood	ZL2VHT	433.225	F1	239	10
Wellington 70cm	Hawkins Hill	ZL2UHF	433.00	F1	533	12
Takaka 70cm	Takaka Hill	ZL2VHN	433.080	A3	915	2
Christchurch 70cm	Marleys Hill	ZL3UHF	433.200	F1	488	2
Auckland 23cm	Nihotupu	ZL1UHF	1297.100	F1	330	10
Waikato 23cm	Hamilton	ZL1VHW	1297.150	F1	97	10
Hawkes Bay 23cm	Napier	ZL2MHB	1297.240	F2	3	1
Taranaki 23cm	Inglewood	ZL2VHT	1297.225	F1	239	5
Wellington 23cm	Hawkins Hill	ZL2UHF	1297.000	F1	533	5
Rodney 13cm		ZL1SHF	2320.803	F2	305	5
Rodney 6cm		ZL1SHF	5765.0	F2	305	0.5
Wellington 3cm	Hawkins Hill	ZL2UHF	10.25 GHz	F2	533	0.3

ARTICLES ON EMC

January 1982 Purpose and Activities, National EMC Advisory Service.

March 1982RFI Directory of Assistance.

April 1982 Justice, Pot—Pour—RI, Persecution?

May 1982 The Radio Communications Act, Responsibility Incidental Radiation, Directory of Assistance.

June 1982EMC — "The Total Problem"

July 1982 High and Low Pass Filters

August 1982Power To Control Interference.

September 1982 Cable Television — North American Experience

October 1982Practical approach to VHF Co—location Problems

November 1982Electromagnetic Energy Near Our Station.

December 1982 On Principles Of RFI

January 1983 Quietening Switching Power Supplies

February 1983 RSTV. CATV. DBS. Australian Comment.

March 1983 USA Government Gives Power To Regulate EMC/RFI Susceptibility To FCC.

April 1983 " A Fair Go"

May 1983 The Radio Communications Bill, EMC Comment.

June 1983 "No Worries?"

July 1983 "The Computer Controlled Car".

August 1983"A Warning From Canada".

September 1983 ESD — "The Electronic Killer".

October 1983 Power Line Interference etc.

November 1983Audio Frequency Interference (AFI).

December 1983 "The Light At The End Of The Year".

January 1984 Electromagnetic Pulse Threat From Nuclear Blast.

February 1984 Designing Against Electromagnetic Emissions.

March 1984West Germany Deals With EMI (EMC).

April 1984 The Need For Improvements To TV Receivers.

May 1984 Interference — "Don't Live In The Past".

June 1984 Electromagnetic Pollution — Are They Zapping You?

July 1984 EMC Standards.

August 1984 Intermodulation, Control

Continued Page 50

10 METRE BEACONS

Freq.	Call	Location	Notes
28.050	PY2GOB	Sao Paulo, Brazil	15W, vertical
28.175	VE3TEN	Ottawa, Ontario, Canada	10W, ground plane
28.195	IY4M	Bologna, Italy	20W, 5/8 ground plane
28.200	GB3SX	Crowborough, England, U.K.	8W, dipole
28.200	KF4MS	St. Petersburg, Florida, USA	75W, ground plane
28.201	LU8ED	Buenos Aires, Argentina	5w
28.2025	ZS5VHF	Durban, Rep. of South Africa	15W, ground plane
28.205	DL0IGI	Mt. Predigtstuhl, W. Germany	100W, vertical dipole
28.207	W8FKL	Venice, Florida, USA	10W, vertical
28.208	WA1IOB	Marlborough, Mass., USA	75W, vertical
28.210	3B8MS	Mauritius	ground plane
28.210	K4KMZ	Elizabethtown, Kentucky, USA	20W, vertical
28.212	EA6RCM	Palma de Mallorca, Span	4W, 5el NNE
28.2125	ZD9GI	Gough Is., South Atlantic	ground plane
28.215	GB3RAL	Slough, Berkshire, U.K.	20W, ground plane
28.215	LU4XI	Puerto Deseado, Argentina	
28.2175	WB9MVY	Oklahoma City, Okl, USA	4W, ground plane
28.220	5B4CY	Zyyi Cyprus	26W, ground plane
28.222	W9UXO	Lake Bluff, Illinois, USA	10W, ground plane
28.2225	HG2BHA	Tapolca, Hungary	10W, ground plane
28.2275	EA6AU	Mallorca, Balearic Is., Spain	10W 5/8 ground plane
28.230	ZL2MHF	Mt. Climie, New Zealand	50W, vertical dipole
28.231	N4LMZ	Mobile, Alabama, USA	2W, 5/8 ground plane
28.232	W7JPI/AZ	Sonoita, Arizona, USA	5W, 3el Yagi NE
28.233	KD4EC	Jupiter, Florida, USA	7W, ground plane
28.235	VP9BA	Hamilton, Bermuda	10W, ground plane
28.2375	LA5TEN	Oslo, Norway	10W, 5/8 ground plane
28.240	OA4CK	Lima, Peru	10W
28.2405	5Z4ERR	Kiambu, Kenya	
28.2425	ZS1CTB	Capteown, Rep of South Africa	20W, 1/4 vertical
28.245	A92C	Bahrain	dipole, NW/SE
28.247	EA3JA	Barcelona, Spain	
28.2475	EA2HB	San Sebastian, Spain	6W, ground plane
28.248	K1BZ	Belfast, Maine, USA	5W, vertical dipole
28.250	Z21ANB	Bulawayo, Zimbabwe	15W, ground plane
28.250	4N3ZHK	Yugoslavia	1W, vertical
28.252	WB4JHS	Durham, North Carolina, USA	7W, vertical
28.255	LU1UG	Gral Pico, Argentina	5W, ground plane
28.2575	DK0TEN	Konstanz, West Germany	40W, ground plane
28.260	VK5WI	Adelaide, SA, Australia	10W, ground plane
28.262	VK2RSY	Sydney, NSW, Australia	25W, ground plane
28.264	VK6RWA	Perth, WA, Australia	
28.266	VK6RTW	Albany, WA, Australia	
28.266	KB4UPI	Birmingham, Alabama, USA	50W, 1/4 vertical
28.2685	W9KFO	Eaton, Indiana, USA	0.75W, vertical
28.270	ZS6PW	Pretoria, Rep of South Africa	10W, 3el Yagi on G-land
28.270	VK4RTL	Townsville, QLD, Australia	
28.2725	9L1FTN	Freetown, Sierra Leone	10W, vertical dipole
28.275	AL7GQ	Jackson, Mississippi, USA	0.5/1W, broadside loop
28.2755	N6RDX	Stockton, California, USA	20W, 3el Yagi
28.2775	DF0AAB	Kiel, West Germany	15W, ground plane
28.280	YV5AYV	Caracas, Venezuela	10W, rotary beam on Europe
28.280	LU8EB	Buenos Aires, Argentina	5W
28.282	VE1MUF	Fredrickton, NB, Canada	0.5W, dipole
28.284	VP8ADE	Adelaide Is., Antarctica	8W, vertical beam to G-land
28.286	KA1YE	Rochester, New York, USA	2W, vertical dipole
28.287	W80MV	Asheville, North Carolina, USA	5W, ground plane
28.287	H44SI	Honiara, Solomon Is.	15W, ground plane
28.288	W2NZH	Moorestown, New Jersey, USA	5W, ground plane
28.290	VS6TEN	Mt. Matilda, Hong Kong	10W, vertical
28.2925	LU2FFV	San Jorge, Argentina	5W, ground plane
28.295	WB8UPN	Cincinnati, Ohio, USA	10W, vertical
28.296	W3VD	Laurel, Maryland, USA	1.5W, vertical dipole
28.297	WA4DJS	Ft. Lauderdale, Florida, USA	10W, 76 meter longwire
28.300	PY2AMI	Sao Paulo, Brazil	10W, vertical dipole
28.300	VE2HOT	Beaconsfield, PQ, Canada	5W, vertical dipole
28.300	ZS1LA	Stillbay, Rep. of South Africa	20W, 3el Yagi NW
28.315	ZS6DN	Irene, Rep. of South Africa	100W, vertical
28.888	W6IRT	North Hollywood, Cal, USA	5W, gnd plane, code practice
28.992	DL0ANN	Nuernberg, West Germany	1W, delta loop

STANDARD FREQUENCY TRANSMISSIONS

WWV and WWVH

The National Bureau of Standards broadcasts standard time and frequency transmissions continuously through stations WWV and WWVH.

Station WWV is located at Fort Collins, Colorado, and broadcasts continuously on the radio frequencies of 2.5, 5, 10, 15 and 20 MHz. Station WWVH is located at Kauai, Hawaii and broadcasts continuously on the radio frequencies of 2.5, 5, 10 and 15 MHz.

Both stations are controlled by caesium atomic oscillators. The frequencies are stable to better than one part in 10^{11} at all times, compared with the primary atomic standards maintained at the NBS Boulder laboratories. Changes in the propagation medium cause frequency changes which are several orders greater than the uncertainties described above.

Standard Time Signals

Seconds pulses are transmitted, continuously, even during tones and announcements, and are derived from the same oscillator which generates the carrier frequency. Each minute, except the first of the hour begins with an 800 millisecond tone of 1000 Hz at WWV and 1200 Hz at WWVH. The first minute of the hour begins with an 800 millisecond tone of 1500 Hz from both stations.

All time announcements are referred to in terms of Co-ordinated Universal Time, UTC. More precisely, the actual time scale is the co-ordinated Universal Time Scale as maintained by the NBS.

The 0 to 24 hours system is used starting with 0000 at longitude zero. The first two figures give the hour and the last two figures give the minutes past the hour when the tone returns. The time announcement refers to the end of an announcement interval, i.e., to the time when the 0.8 second long audio tone begins.

At WWV a male voice announcement of Co-ordinated Universal Time is given during the last 7.5 seconds of each minute. At 10.35 UTC for instance, the voice announcement, given in English, is: "At the tone, ten hours thirty-five minutes Co-ordinated Universal Time".

At WWVH a female voice announcement of UTC is given during the period 45 seconds to 52.5 seconds after the minute. It should be noted that the voice announcement of WWVH precedes that of WWV by 7.5 seconds. However, the tone markers referred to in both announcements occur simultaneously, although they may not be so received due to propagation effects. The use of a female voice at WWVH and a male voice at WWV assists in distinguishing the two stations.

Universal Time Corrections

With the use as from the beginning of 1972 of the atomic time scale as the International time scale and because the rate of rotation of the earth is not constant, differences between mean solar time (UT1) and the atomic time will accrue which in time could become inconvenient. It is therefore necessary to make periodic adjustements to the atomic scale so that it roughly approximates UT1. Therefore, instead of frequent small corrections, as in the past, large corrections of one full second will be made at infrequent intervals., which are not expected to average more than one a year and will usually be made on the last day of either June or December.

An adjustment was made on December 31 1987 of one second so that the atomic time scale now leads UTI by 24 seconds. The atomic time scale will thus be at all times within one second of mean solar time. These corrections will be encoded and broadcast once every minute from both stations.

The method of coding UT1 corrections uses a system of double second pulses. The first through the eighth second pulse, when marked by a double pulse, will indicate a "plus" correction, and from the ninth through the fifteenth a "minus" correction. The amount of correction is determined by counting the number of second pulses which are doubled. For example, if the first, second and third second pulses are doubled, the UT1 correction is 0.3 seconds. Or if the ninth, tenth, eleventh, twelfth, thirteenth and fourteenth second pulses are doubled, the UT1 correction is "minus" 0.6 seconds. The UT1 correction is also encoded in the IRIG-H BCD code.

Standard Audio Frequencies

Standard audio frequencies of 440 Hz, 500Hz and 600Hz are broadcast by the two stations. The duration of each transmitted tone is approximately 45 seconds. A 600 Hz tone is broadcast by WWV during odd minutes and during even minutes by WWVH. A 500 Hz tone is broadcast during alternate periods unless voice announcement sor silent periods are scheduled. The 440 Hz tone is broadcast beginning one minute after the hour at WWVH and two minutes after the hour at WWV. The 440 HZ tone is omitted during the first hour of the UTC day to act as a day marker.

No audio tones or special announcements are broadcast during a semi-silent period from either station. The periods are from 45 to 50 minutes after the hour from WWV and from 15 minutes to 20 minutes after the hour at WWVH.

The 29th and 59th seconds are omitted in each minute. Each pulse is preceded by 10 milliseconds of silence and followed by 25 milliseconds of silence.

Propagation and Geophysical Forecasts

A broadcast of radio propagation conditions and solar activity is broadcast in voice during part of every eighteenth minute of each hour from WWV. The announcements are short term forecasts, updated as required, every six hours if needed. Those operators particularly interested should consult QST, January 1975, page 84, for specific details.

Omega navigation system status reports are broadcast in voice from WWV at 16 minutes after the hour and from WWVH at 47 minutes after the hour. The International Omega Navigation System is a very low frequency radio navigation aid operating in the 10 to 14 kHz frequency band. Eight stations are in operation around the world. Omega, like other radio navigation systems is subject to signal degradation caused by ionospheric disturbances at high latitudes. The Omega announcements are given to provide users with immediate notification of such events. The Australian station in East Gippsland is on 13 kHz.

VNG

The Australian national frequency and time signal service, which had been provided by the station VNG at Lyndhurst Victoria, was closed down by its operators, Telecom Australia, for financial reasons in October 1987.

A consortium of organisations interested

in re—activating the service has been formed. It is called the VNG Users Consortium and the address of its secretary is :

Dr Marion Leiba
26 Fimister Circuit
Kambah ACT 2902

At the time of writing VNG is operating on 5 MHz only from a transmitter site at Llandilo near Sydney. Further frequencies are pending . Those who need the latest information on the status of VNG may contact Dr Leiba on (062) 49 9355 (BH), (062) 31 9476 (AH), or the transmitting station on (02) 628 9777.

Time Signal Systems

The system is the complete grouping of dots and dashes which lead up to and follow the hour signal. The majority of stations conform to one of the following systems.

English

Continuous series of 0.1 SEC pulses every second, lengthened to 0.4 SEC every minute. The commencement of each pulse is the timing reference point. Radiated for 5 MIN preceding the time signal.

British Broadcasting Corporation

Six pulses (five 0.1 SEC pulses) representing successive seconds, followed by a final pulse (of 0.5 SEC) the beginning of the final pulse make the minute.

United States

Radiated for 5 MIN preceding the time signal. Series of pulses every second, 29th second of each minute, and certain seconds after the 50th second of each minute are silent.

Guam (NPN)

Frequency 21,760 kHZ, 17,530 kHZ, 13,380 kHZ, 8,150 kHZ, 4,955 kHZ

Time: 0555-0600, 1155—1200, 1755—1800, 2355—000

System: United States. Time between 56—59 sec every MIN.

Honolulu (Hawaii) (NPM)

Frequency: 22,593 kHZ, 13,655 kHZ, 9050 kHZ, 4,525 kHZ, 131.05 kHZ, A1A 15kw

Time: 0555—0800, 1155—1200, 1755—1800, 2355—000.

System: United States. Time between 5659 sec every MIN.

Remarks: Correct to 0.5 SEC.

Kauai (Hawaii) (WWVH)

Frequency:15,000 kHZ, (10kw), 10,000 kHZ (10kw), 5,000 kHZ (10kw), 2,500 kHZ (5.0kw) A3E.

Time: H24

Details of Signals:Voice announcement of time every minute.. Ticks every second except on 29th & 59th seconds; 5 MIN interruption HR + 15.

Source: National Bureau of Standards, Coulder, Colorado

Wellington (ZLW) (ZMO)

Frequency: 417.5 kHZ

Time: 2254—2300

Preparatory Signals:54 MIN 10 SEC — 54 MIN 40 SEC, ZMO (4 times)

Time Signal: 55 SEC — 60 SEC.

System: English

Source: New Zealand Time Service, Wellington (ZMO), Automatic Transmission.

Remarks: Error does not ex ceed 0.01 SEC.

AUSTRALIAN VHF, UHF AND SHF RECORDS

CORRECT AS AT 01 OCT 88

Legend
* — Australian record
# — New record since last edition

1. Home/Portable Category

Australian Capital Territory						
50 MHz	#	No claim				
144 MHZ	#	VK1RH	to	VK1ZJR	1/03/87	16.3 km.
New South Wales						
50 MHz	#	VK2AGZ	to	VE1ASJ	06/04/81	16,653.4 km.
144 MHz	#	VK2ZRU	to	VK6AOM	13/12/86	2,697.9 km.
432 MHz	#	VK2ZAB	to	ZL1AKW	13/01/88	2,299.8 km.
576 MHz		VK4ZRF/2	to	VKZ4SH/4	11/12/81	255.4 km.
1,296 MHz		VK2BDN	to	ZL1AVZ	9/12/82	2,132.7 km.
2,300 MHz		VK2ZAC/2	to	VK2BDN/2	19/05/73	159.9 km.
3,300 MHz		VK2AHC/2	to	VK2SB/2	16/01/77	114.1 km.
5,650 MHz	*	VK2AHC/2	to	VK2SB/2ZND/2	12/04/75	114.1 km.
10,000 MHz		VK2AHC/2	to	VK2SB/2ZND/2	12/04/75	114.1 km.
Victoria						
50 MHz		VK30T	to	VP2VGR	17/03/81	16,663.3 km.
144 MHz		VK3YLR/3	to	VK6KZ/6	23/01/80	2,784.2 km.
432 MHz	*	VK3ZBJ	to	VK6KZ/6	23/01/80	2,715.9 km.
576 MHz		VK3AOT/3	to	VK3ZKB/3	11/07/71	237 km.
1,296 MHz	#*	VK3ZBJ	to	VK6WG	18/03/88	2,449.3 km.
2,300 MHz		VK3ZHP	to	VK7HL	12/01/85	427.3 km.
3,300 MHz	#	VK3KAJ/3	to	VK3ZBJ	25/01/86	244.3 km.
5,650 MHz		No claim				
10,000 MHz	*	VK3KAJ/3	to	VK3ZBJ/3	8/02/86	252.1 km.
Queensland						
50 MHz		VK4AYX	to	DL3ZM/YV5	18/03/81	15,582 km.
144 MHz	*	VK4ZSH/4	to	JA7OXL	24/04/83	6,616.9 km.
432 MHz		VK4LC	to	ZL3TAL	24/11/82	2,283.4 km.
576 MHz	*	VK4ZRF/4	to	VK4ZSH/4	7/12/81	377.6 km.
1,296 MHz		AX4NO/4	to	AX4ZT/2	12/04/70	402 km.
2,300 MHz		No claim				
3,300 MHz		No claim				
5,650 MHz		No claim				
10,000 MHz		VK4ZNC/4	to	VK4ZSH/4	9/11/81	170.6 km.
South Australia						
50 MHz		VK5KK	to	XE1GE	9/04/79	14,078 km.
144 MHz		VK5ZEE	to	ZL1HH	15/01/86	3,458.8 km.
432 MHz		VK5NY	to	VK7JG	21/05/85	995.0 km.
576 MHz		VK5ZJL/5	to	VK5QZ/5	28/12/69	314 km.

Continued next page

1,296 MHz	*	VK5MC	to	VK6KZ/6	23/01/80	2,289.4 km.
2,300 MHz	*	VK5QR	to	VK6WG	17/02/78	1,885.5 km.
3,300 MHz	#*	VK5QR	to	VK6WG	25/01/86	1,885.5 km.
5,650 MHz		No claim				
10,000 MHz		VK5CU/5	to	VK5MW/5	30/12/71	95.7 km.
Western Australia						
50 MHz		VK6BE	to	JA8BP	30/10/58	8,833 km.
144 MHz		VK6KZ/6	to	VK3YLR/3	23/01/80	2,784.2 km.
432 MHz	*	VK6KZ/6	to	VK3ZBJ	23/01/80	2,715.9 km.
576 MHz		VK6KZ/6	to	VK6HK	16/01/83	196.4 km.
1,296 MHz	#*	VK6WG	to	VK3ZBJ	18/03/88	2,449.3 km.
2,300 MHz	*	VK6WG	to	VK5QR	17/02/78	1,885.5 km.
3,300 MHz	#*	VK6WG	to	VK5QR	25/01/86	1,885.5 km.
Tasmania						
50 MHz		VK7JG	to	W5FF	17/04/82	13,765 km.
144 MHz		VK7ZAH	to	VK4ZAZ	1/01/67	1,910 km.
432 MHz		VK7JG	to	VK5NY	21/05/86	995.0 km.
1,296 MHz		VK7ZAH	to	VK3AKC	17/02/71	439 km.
2,300 MHz		VK7HL	to	VK3ZHP	12/01/85	427.3 km.
Northern Territory						
50 MHz	*	VK8GB	to	9Y4LL	10/04/82	18,665.4 km.
144 MHz		VK4ZSH/8	to	JA7OXL	24/10/82	6,460.9 km.
2. EME Category						
144 MHz		VK3ATN	to	K2MWA/2	28/11/66	16,761 km.
432 MHz		VK6ZT	to	K2UYH	29/01/83	18,726.4 km.
1,296 MHz		VK3AKC	to	W2NFA	6/10/73	16,713 km.
3. ATV Category						
432 MHz		VK7EM/T	to	VK3ZPA/T	13/12/72	413 km.
4. Mobile Category						
144 MHz	#	VK3KAJ/M	to	VK6BE	25/186	2,224.5 km.
432 MHz	#	VK3KAJ/M	to	VK6BE	25/1/86	2,224.5 km.
5. Digital Modes Category						
52 MHz	#	VK4KHG	to	VK2YVG	17/12/87	1,253.5 km.

A GUIDE TO THE AMATEUR SATELLITE SERVICE

AMSAT-Australia is the name used by the wing of the **Wireless Institute of Australia** that supports all Amateur Satellite Activities in Australia. It is actually managed by one of the W.I.A.'s Federal Officers, **Graham Ratcliff**, VK5AGR who has the title of **National Co-ordinator**. AMSAT—Australia has a **monthly column** in **"Amateur Radio'**, however, in April 1985 AMSAT-Australia began production of a **Newsletter** with two aims in mind, one to supply the latest information quickly and secondly to raise a modest sum of money per subscriber to go directly towards the purchase of hardware for future amateur satellites. To obtain a complimentary copy of the Newsletter send a self-addressed stamped envelope (S.A.S.E.) to **AMSAT-Australia C/- GPO Box, 2141, Adelaide S.A. 5001**. Currently, the Newsletter costs $20 for one year's airmail subscription and entitles you to receive 12 issues each mailed on the last Saturday of month. **AMSAT—Australia** also offers a number of other 'Services' for the Amateur Satellite enthusiasts.

Amsat—Australia Net

This Net commences at 0945Z every Sunday night on 3.685 MHZ primary 7.064 MHz secondary +/- QRM with early check-ins. The Net is co-ordinated by Graham Ratcliff, VK5AGR and officially starts at 1000utc with one or two sets of Keplerian Elements (required by Satellite Tracking Software) followed by Reference Orbits for the circular orbit satellites, this is then followed by a roundup of the latest information on the Amateur Satellite Service from around—the—world. This is followed by a correspondence report and the Net concludes with a 'round—robin' discussion in a weekly rotational State order. AMSAT S.W. Pacific Net 14.282 MHz Sat 2200Z

AMSAT—Australia Software Service

AMSAT—Australia has satellite tracking and decoding software for almost every variety of home computer. The normal procedure for obtaining an Amateur Satellite Tracking or Decoding Program is to send the appropriate blank media (tape or disk) plus sufficient to cover return postage plus a donation to AMSAT—Australia of $10 per program requested. Please, when sending requests for software always include a complete description of your computer system hardware to ensure that I can supply the appropriate software for your particular hardware configuration. Depending on the brand of computer I may need to know things like memory size, type of printer, operating system, etc.

Amateur Satellite Handbooks

AMSAT—Australia can supply a number of handbooks on Amateur Satellites. The UoSAT Handbook contains 61 (A4) pages and was produced by University of Surrey. The Fuji OSCAR—12 Technical Handbook contains 74 (A5) pages and was produced by AMSAT—UK as was the RS10/11 Handbook which contains 20 (A5) pages. AMSAT—UK also produced another booklet called 'Amateur RadioSatellites — The first 25 Years' which contains 34 (A5) pages. AMSAT—Australia can also supply copies of the ARRL publication, **'The Satellite Experimenters Handbook' by Martin Davidoff,** which is recommended reading for all newcomers to the Amateur Satellite Service.

Printed Circuit Boards

AMSAT—Australia can also supply a number of PCBs for projects to decode satellite telemetry and bulletins from UoSAT Oscar 9 & 11, Oscar 13 and Fuji—Oscar 12. All three projects were designed by James Miller G3RUH and the PCBs are produced by AMSAT—UK. For more details contact AMSAT—Australia C/— GPO Box 2141, Adelaide S.A. 5001 and please include an S.A.S.E.

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Amateur Satellite Frequency Guide

UoSAT OSCAR—9

Beacons on 40 metres, 20 metres, 15 metres, 10 metres, 2 metres, 70 centimetres and 13 centimetres — no transponders.

2M Beacon	145.825 MHz	(P)
70 cm Beacon	435.025 MHz	(S)

The 2M & 70cm beacons carry primarily 1200 baud ASCII 7 (or 8) bit telemetry & bulletins using Kansas City tones of 1200 & 2400 Hz.

(Propagation Study Experiments)

40M Beacon	7.050 MHz
20M Beacon	14.002 MHz
15M Beacon	21.002 MHz
10M Beacon	29.502 MHz
SHF Beacon	2401 MHz
SHF Beacon	10470 MHz

The propagation study beacons transmit either morse code or a steady carrier. The 2401 MHz beacon can also carry the standard telemetry format.

UoSAT OSCAR—11

Beacons on 40 metres, 20 metres, 15 metres, 10 metres, 2 metres, 70 centimetres and 13 centimetres — no transponders.

2M Beacon	145.826 MHz	(P)
70cm Beacon	435.025 MHz	(S)
13cm Beacon	2401.5 MHz	(S)

The 2M, 70cm & 13cm beacons carry primarily 1200 (or 4800) baud ASCII 7 (or 8) bit telemetry & bulletins using Kansas City tones of 1200 & 2400 Hz.

AMSAT OSCAR—10

Due to radiation damage to the Onboard Computer memory the Mode L transponder & beacons are no longer active. However, the Mode B transponder and beacons continue to operate when there is sufficient solar illumination on the solar panels.

Mode B Transponder

Uplink Passband

435.027 - 435.179 MHz

Downlink Passband

145.977 - 145.825 MHz

The transponder is linear and inverting, i.e. LSB on the uplink results in USB on the downlink, and the translation equation is:

Downlink Frequency = 581.004 — Uplink Frequency = +/- Doppler Shift

The General Beacon is on 145.810 MHz and the Engineering Beacon is on 145.987 MHz. Due to the OBC memory failure the General Beacon only transmits

Continued next page

RTTY AMTOR

Frequency Shift

The Standard amateur Frequency shift for **RTTY** is 170 Hz.
The Standard international Frequency shift for **AMTOR** is 170 Hz.
It can be obtained by two different methods:—

(a) By using the inbuilt Frequency Shift Keying (FSK) method, which is found on H.F. only transceivers and is usually a TTL input.

(b) By injecting the appropriate audio tones into the microphone circuit. The tone pairs used in Australia are **2125 Hz** for the **Mark** tone and **2295 Hz** for the **SPACE** tone.

Commercial stations use various shifts on RTTY, but the most common are 170, 425 and 850 Hz shifts.

Standard Speeds

The standard international speed for amateur RTTY stations is 45 Baud (or 60 words per minute).
Some countries use 50 Baud (or 66 words per minute) internally as do some local VK amateur Sunday broadcasts. Commercial traffic users have various speeds, but the main ones used are 50, 57, 75 and 110 Baud.
The speed for AMTOR is 100 Baud. This speed is laid down in the internationally agreed CCIR 476-4) recommendation and is used by amateurs, ships, Interpol, embassies and various other commercial stations etc.

Calling and Net Frequencies

RTTY	AMTOR
1.825 MHz call	1.825 MHz call
3.545MHz call, net, bct	3.545 MHz call, net
3.630 MHz call	3.630 MHz call
7.045 MHz call, net, bct	7.045 MHz call, net, bbs
10.145 MHz call	10.145 MHz call
14.090 MHz call, net, bct	14.075 MHz call, bbs
18.100 MHz call	18.100 MHz call
21.090 MHz call, net	21.075 MHz call, net, bbs
21.125 MHz call	21.125 MHz call
24.920 MHz call	24.920 MHz call
28.090 MHz call, net	28.075 MHz call, net
52.075 MHz call	52.075 MHz call
146.600 MHz call, net, bct	146.600 MHz call, net
146.675 MHz call, net, bct, bbs, rptr	146.675 MHz call, rptr
432.075 MHz call	432.075 MHz call
1,252.1 MHz call	1,252.1 MHz call

HF Mailboxes (AMTOR)

The days of RTTY mailboxes were numbered when AMTOR first appeared on the scene in later 70s. Below is a list of MAJOR AMTOR mailboxes and whether or not they support the new APLINK system. APLINK is the new forwarding method for AMTOR to Packet or Packet to AMTOR mailboxes. All mailboxes listed below are 24Hr per day systems.

Country	Callsign	SELCAL	Frequency	Other information
Australia	VK2AGE	VAGE	7.045 MHz 14.073 MHz 14.074 MHz 14.075 MHz 14.076 MHz 14.077 MHz	Listens for 12 seconds on each freq. and has APLINK facilities.
U.S.A.	WA8DRZ	WDRZ	14.072.5 MHz 14.073.5 MHz 14.076.5 MHz 14.075.5 MHz	Listens for 12 seconds on each freq. and has APLINK facilities.

England	G3PLX	GPLX	3.587.5 MHZ 3.588.0 MHz 3.588.5 MHz 3.589.0 MHz 14.075 MHz 14.076 MHz 14.077 MHz 14.078 MHz 21.075 MHz 21.076 MHz 28.075 MHz 28.076 MHz	Listens for 12 seconds on each freq. and has APLINK facilities
Malaysia	9M2CR	NMCR	14.078 MHz	
Sweden	LA9OK	LAOK	3.588 MHz 7.030 MHz 14.073 MHz 14.075 MHz	
Holland	PAORYS	PRYS	3.583 MHz 3.588 MHz 3.585 MHz 14.073 MHz 14.075 MHz 14.077 MHz 21.075 MHz 28.075 MHz	Listens for 12 seconds on each freq. This station uses LOW tones so will seem off freq by 925 Hz
Guatemala	TG9VT	TGVT	14.073.5 MHz	
Kuwait	9K2KA	NKKA	14.070 MHz	
Egypt	SU1ER	SUER	14.070 MHz 14.075 MHz	Thought to be 12 seconds per freq.
Japan	JA5TX	JATX	14.076 MHz 14.078 MHz 14.080 MHz	Listens for 12 seconds on each freq.

RTTY/AMTOR Clubs:— including Broadcast times and frequencies

Australian Amateur Radio Teleprinter Group inc (AARTG)

Club Callsign:— VK6TTY
ADDRESS:— 12 Selway Rd, Brentwood, WA 6153
Broadcasts: — Local RTTY news Sundays.
Evening — 10.30 Z on 3.535 MHz and 146.600 MHz.

Australian National Amateur Radio Teleprinter Society (ANARTS)

Club Callsign:— VK2TTY
Rptr Callsign:— VK2RTY — 146.675 MHz
Address:— PO Box 860 Crows Nest, NSW 2065
Broadcasts:— National, International and Local RTTY news on Sundays
Morning RTTY — 00.30 Z on 7.045 MHz, 14.090 MHz, 14.095 MHz and 146.675 MHz.
Morning AMTOR (Mode B) — 00.30 Z on 14.073 MHz
Evening RTTY — 09.30 Z on 3.545 MHz and 146.675 MHz
Broadcast can also be found on various AMTOR Mailboxes and Packet Radio Bulletin Board Systems.

Queensland Amateur Radio Data and Teletype Association inc. (QARDATA)

Club Callsign:– VK4TTY
Rptr Callsign:— VK4RBT — 147.650 MHz
Address:— PO Box 184 Fortitude Valley, Qld 4006
Broadcasts:— International and local RTTY news Mondays.
Evening — 20.00 local on 3.630 MHz, 7.045 MHz, 14.090 MHz and 147.650 MHz.
Broadcasts can also be found on various Packet Radio Bulletin Board Systems.

a steady carrier. The Engineering Beacon is now rarely ever heard.

FUJI OSCAR—12

Fuji OSCAR 12 has two transponders and two associated beacons.

Mode JA Transponder — Analogue (i.e. voice)

Uplink Passband	Downlink Passband
145.9 - 146.0 MHz	435.9 - 435.8 MHz

Beacon — 435.795 MHz +/- Doppler Shift

The transponder is linear and inverting, i.e. LSB on the uplink results in USB on the downlink and the translation equation is:

Uplink Frequency = 581.800 — Downlink Frequency +/- Doppler Shift

The beacon transmits telemetry information in morse code.

Mode JD Transponder — Digital (1200 baud PSK)

Uplink Freq	Downlink Freq
Channel 1 145.850	435.910 MHz
Channel 2 145.870	435.910 MHz
Channel 3 145.890	435.910 MHz
Channel 4 145.910	435.910 MHz

Beacon — 435.910 MHz +/- Doppler

Uplink is 2M FM and the downlink is 1200 baud PSK on SSB and uses AX.25 V2 Packet Radio protocol.

RS — 10

RS—10 is one of two Russian Amateur Satellite Transponders attached to the Russian Navigational Satellite COSMOS 1861.

Mode	Uplink Band	Downlink Band
K	21.160 - 21.200	29.360 - 29.400
T	21.160 - 21.200	145.860 - 145.900
A	145.860 - 145.900	29.360 - 29.400
KT	21.160 - 21.200	29.360 - 29.400 & 145.860 - 145.900
KA	21.160 - 21.200	29.360 - 29.400 & 145.860 - 145.900

Beacons: 29.357, 29.403, 145.857 and 145.903

Robot Transponders

Mode	Uplink	Downlink
T	21.120	145.857 or 145.903
K	21.120	29.357 or 29.403
A	145.820	29.357 or 29.403

RS—11

RS—11 is the second of the two Russian Amateur Satellite Transponders attached to the Russian Navigational Satellite COSMOS 1861.

Mode	Uplink Band	Downlink Band

Continued next page

K	21.210 - 21.250	29.410 - 29.450
T	21.210 - 21.250	145.910 - 145.950
A	145.910 - 145.950	29.410 - 29.450
KT	21.210 - 21.250	29.410 - 29.450
KA	21.210 - 21.250	29.410 - 29.450 & 145.910 - 145.950

Beacons: 29.407, 29.453, 145.907 and 145.953

Robot Transponders

Mode	Uplink	Downlink
T	21.130	145.907 or 145.953
K	21.130	29.403 or 29.453
A	145.830	29.403 or 29.453

The transponders on RS10/11 are linear and non-inverting transponders i.e. USB on the uplink produces USB on the downlink. Also note that a frequency on the low end of the uplink passband corresponds to a frequency on the low end of the downlink passband. Beacons transmit telemetry information in morse code.

Ground Stations (eg VK5ABC) would have a CW QSO with these Robot Transponders by sending RS10 DE VK5ABC AR on the uplink frequency and the ROBOT will respond on one of the downlink frequencies VK5ABC DE RS10 QSL NR 123 OP ROBOT TU QSO NR 123 73 SK.

AMSAT OSCAR-13

Mode B Transponder:

Input	435.420 MHz to 435.570 MHz
Output	145.825 MHz to 145.975 MHz
General Beacon	145.812 MHz
Engineering Beacon	145.985 MHz

Necessary transmit power at a ground station = 1w to a 12 dBic antenna (right—hand circular).

Mode L Transponder:

Input 1	1269.620 MHz to 1269.330 MHz
Output 1	435.715 MHz to 436.005 MHz
Input 2	144.425 MHz to 144.475 MHz
Output 2	435.990 MHz to 435.940 MHz
General Beacon	435.651 MHz
RUDAK Input	1269.710MHz
RUDAK Output	435.677 MHz

Necessary transmit power at a ground station = 3 w to a 24 dBic antenna (right—hand circular).

Mode S Transponder:

Input	435.601 MHz to 435.637 MHz
Output	2400.711 MHz to 2400.747 MHz
Beacon	2400.325 MHz

Necessary transmit power at a ground station = 10 w to a 12 dBic antenna (right—hand circular).

ar

AMATEUR RADIO CLUB NETS

Australian Ladies Amateur Radio Association (ALARA)
4th
Mon 3.580 MHz 1030Z

Australian National Amateur Radio Teleprinter Society (ANARTS)
7.045 MHz 0300Z
14.090 " "
14.095 " "
146.675 " "
3.545 " 0930Z
146.675 MHz "

Land Forces Amateur Radio Group
Wed 3.595 MHz 0930Z

Royal Naval Amateur Radio Society (RNARS)
Mon 3.613 MHz 1000Z
Mon 3.620 MHz 1100Z
Tue 3.575 MHz 1030Z

Royal Signal Amateur Radio Society (VK Chapter)
Wed 3.615 MHz 1030Z
Sat 14.175 " 0600Z

"28" Chapter Ten-Ten International Net Inc
Sun 28.560 MHz 0230Z

Schools Across Australia
Fri 21.180 MHz 0430Z

VK8

Alice Springs Amateur Radio Club
Sun 21.180 MHz 0400Z
" 28.490 MHz "

Darwin Amateur Radio Club
Sun 3.555 MHz Following VK5 B/Cast
" 146.500 MHz " "

VK1

Australian Capital Chapter of Ten-Ten Int. Net Inc.
Fri 28.595 MHz 2300Z

VK2

Armidale & District Amateur Radio Club
DLY 3.588 MHz H24
146.950 " "
438.025 " "

Blue Mountains Amateur Radio Club
Tue 147.050 MHz 1000Z
438.375 " "

Central Coast Amateur Radio Club
Tue 3.560 MHz 1000Z

Chifley Amateur Radio Club
DLY 28.490 MHz 1000Z
147.550 " "

Fishers Ghost Amateur Radio Club
Fri 3.580 MHz 1000Z
Sun 28.520 MHz 1000Z

Gladesville Amateur Radio Club
Wed ATV Tests (CH 35 UHF TV) 0930Z

Glen Innes & District Amateur Radio Club
Tue 146.500 MHz 0730Z
Sun 3.580 MHz 1000Z

Goulburn Amateur Radio Club
Sun 3.615 MHz 1100Z

Griffith Radio Club
Wed 28.480 MHz 1100Z

Hornsby & District Amateur Radio Club
Mon 28.370 MHz 1000Z
" 147.250 " "

Illawarra Amateur Radio Society Inc
Sun 3.562 MHz 1000Z

Mid South Coast Amateur Radio Club
Wed 3.617 MHz 0930Z
" VK2RMU 1030Z

North West Amateur Radio Group
Mon 3.575 MHz 1030Z

Novice Amateur Radio Group of NSW
Tue 28.385 MHz 1000Z

Orana Region Amateur Radio Club
Wed 3.620 MHz 1000Z

Orange Amateur Radio Club
Sun 146.700 MHz 1030Z

Oxley Region Amateur Radio Club
Thu 3.595 MHz 1000Z

Shoalhaven Amateur Radio Club
DLY VK2RSD 0800Z

St George Amateur Radio Society
Sat 3.555 MHz 2200Z
Tue 14.110 " 0930Z
" 28.520 " "
Thu 146.800 " 1000Z

Southern Highlands Amateur Radio Society
Sun 3.615 MHz 1015Z

Tamworth & District Amateur Radio Club
Sun 3.620 MHz 0100Z
Wed " " "

Taree & District Amateur Radio Club Inc
Mon 3.620 MHz 0930Z
" 146.500 " 1000Z

Twin Cities Radio 4 Electronics Club
1st, 3rd, 5th
Mon 28.490 MHz 0930Z

Wagga Amateur Radio Club
(Award net)
Tue 3.605 MHz 1030Z
Sun 7.165 " 0200Z
DLY 28.490 " H24

Waverley Amateur Radio Society
1st,3rd,4th,5th
Tue 147.075 MHz 0930-1015Z
" 28.505 " 1000-1015Z*
*(CW Practice net)

Western Suburbs Amateur Radio Club
Sun 28.560 MHz 1000Z

Westlakes Amateur Radio Club
Thu 147.100 MHz 1000Z

VK3

Ballarat Amateur Radio Group (BARG)
Thu 3.610 MHz 1000Z

Eastern & Mountain District Radio Club (EMDRC)
Tue 147.350 MHz 1000Z
(RTTY)
Wed 3.572 " 1000Z
Sat 28.474 " 2330Z

Frankston & Mornington Peninsula Amateur Radio Club
(FAMPARC)
Wed 3.570 MHz 1000Z

Geelong Radio & Electronics Society
Mon 3.560 MHz 1000Z

Gippsland Gate Radio & Electronics Club
Thu 3.585 MHz 1000Z

Moorabbin & District Radio Club
Mon 3.567 MHz 1000Z

Southern Peninsula Amateur Radio Club
Tue 3.620 MHz 0930Z
Sat " " 2330Z

Sunbury Amateur Radio Group
Wed 146.450 1100Z

Tallangatta Radio Club
Fri 3.600 MHz 0930Z

Victorian Railways Institute Wireless Club
Wed 3.585 MHz 0900Z
Sun 52.080 " 2315Z

Western & Northern Suburbs Amateur Radio Club
Tue 145.450 MHz 0930Z
" 28.470 " 1030Z

WIA Eastern Zone
Sun VK3RLV 0930Z

WIA East Gippsland Zone
Mon 3.585 MHz 1000Z

WIA Midland Zone
Tue 14.200 MHz 1000Z
Thu 3.595 " "

VK4

Brisbane Amateur Radio Club
Mon 28.440 MHz 0930Z
Wed 146.550 " 0930Z

Brisbane North Radio Club
Mon 28.420 MHz 0930Z

Cairns Amateur Radio Club
Sat 3.572 MHz 22230Z
Wed " " 1000Z

Central Highlands Amateur Radio Club
SAT 3.572 MHz 0930z

City of Brisbane Radio Society
Sun 3.575 MHz 1000Z

Darling Downs Radio Club
Sat 3.587 MHz 0930Z

Gladstone Amateur Radio Club
Thu 3.570 MHz 0900Z

Gold Coast Amateur Radio Society (GCARS)
DLY 146.700 MHz 2200Z
Sat 3.615 " 2200Z
Tue 28.450 " 0930Z*
*(WICEN Training Net)
Mon 1.840 MHz 0930Z
Wed 3.605 " "

Ipswich & District Radio Club
Thu 28.500 MHz 0930Z
(Oct— Apr)
" (Apr—Oct)

Mackay Amateur Radio Club
Fri 3.615 MHz 1030Z

Mount Isa & District Amateur Radio Club
Tue 3.610 MHz 1000Z

Queensland Amateur Radio Data & Teletype Association (QARDATA) Inc
Mon 147.650 MHz 1000Z
(B/Cast)
3.630 "
7.045 "
14.090 "

Redcliffe Radio Club
Sun 3.612 MHz 0930Z

Roma & District Amateur Radio Club
Fri 3.610 MHz 1000Z

South East Queensland ATV Group
Tue (147.300 MHz) 0930Z
(579.250 ")

Sunshine Coast Amateur Radio Club
Thu 3.595 MHz 0900Z

Townsville Amateur Radio Club
Sun 3.605 MHz 0930Z
Sun VK4RAT 2100Z

WIA Queensland Division
Thu 3.605 MHz 0930Z
" " " 1000Z

VK5

Central North ATV Group
Wed 444.250 1000Z
" 147.300 "

Lower Eyre Peninsula Amateur Radio Club Inc (LEPARC)
DLY 3.560 MHz 0930Z

Lower Murray Amateur Radio Club Inc.
Mon 3.620 MHz 1000Z

Port Adelaide Radio Club
DLY 28.440 MHz 1000Z

Port Augusta Amateur Radio Club
Thur 3.600 MHz 1000Z
Fri 28.490 " 2330Z
" 146.500 " "

South Australian ATV Group
Wed VK5RTV
" VK5RCN
" 147.400 MHz
" 147.300 MHz

South Coast Amateur Radio Club
Tue 3.595 MHz 1000Z

South East Radio Group
Mon 3.585 MHz 1100Z
" 146.900 " "

Whyalla Amateur Radio Club
Tue 3.595 MHz 0900Z
Sat 28.525 " 0230Z

VK6

Australian Amateur Radio Teleprinters Group (AARTG)
Sun 146.600 MHz 1030Z
3.535 "

North West Radio Society
Sun 3.605 MHz 1130Z
" 28.445 " "

Peel Amateur Radio Group
Sun 3.575 0030Z

Southern River Amateur Radio Club (SRARC)
DLY 145.250 MHz H24

South-West Amateur Radio Group (SWARG)
Last Tue 3.605 MHz

ARRL DXCC COUNTRIES LIST

Note: # Third party traffic permitted with special events stations in the United Kingdom having the prefix GB only, with the exception that GB3 stations are not included in this agreement.

Note: * Indicates current list of countries for which QSLs may be forwarded by the ARRL membership outgoing QSL service.

Note: † Indicates countries with which U.S. amateurs may legally handle third-party message traffic.

Prefix	Country
A2*	Botswana
A3*	Tonga
A4*	Oman
A5	Bhutan
A6	United Arab Emirates
A7	Qatar
A9*	Bahrain
AP–AS*	Pakistan
BV	Taiwan
BY, BT*	China
C2*	Nauru
C3*	Andorra
C5†*	The Gambia
C6*	Bahamas
C8–9	Mozambique
CA—CE†*	Chile
CE9/KC4▲*	Antarctica
CEø*	Easter I.
CEø†*	San Felix
CEø†*	Juan Fernandez
CM, CO†*	Cuba
CN*	Morocco
CP†*	Bolivia
CT*	Portugal
CT3*	Madeira Is.
CU*	Azores
CV—CX†*	Uruguay
CYø	Sable I.
CYø	St. Paul I.
D2—3*	Angola
D4*	Cape Verde
D6[26]	Comoros
DA—DL2*	Fed. Rep. of Germany
DU—DZ*	Philippines
EA—EH*	Spain
EA6—EH6*	Canary Is.
EA8—EH8*	Balearic Is
EA9—EH9*	Ceuta and Melilla
EI—EJ*	Ireland
EL†*	Liberia
EP—EQ*	Iran
ET	Ethiopia
F*	France
FT8W*	Crozet
FT8X*	Kerguelen Is.
FT8Z*	Amsterdam & St. Paul Is.
FG*	Guadeloupe
FJ, FS[1]*	Saint Martin
FH[26]*	Mayotte
FK*	New Caledonia
FM*	Martinique
FO*	Clipperton I.
FO*	Fr. Polynesia
FP*	St. Pierre & Miquelon
FR/G[4]*	Glorioso Is.
FR/J,E[4]*	Juan de Nova, Europa
FR*	Reunion
FR/T*	Tromelin
FW*	Wallis & Futuna Is.
FY*	Fr. Guiana
G*#	England
GD*	Isle of Man
GI*	Northern Ireland
GJ*	Jersey
GM*	Scotland
GU*	Guernsey & Dep.
GW.*	Wales
H4*	Solomon Islands
HA, HG*	Hungary
HB*	Switzerland
HBø*	Liechtenstein
HC—HD†*	Ecuador
HC8—HD8†*	Galapagos Is.
HH†*	Haiti
HI*	Dominican Republic
HJ—HK†*	Colombia
HKø†*	Malpelo I.
HKø†*	San Andreas & Providencia
HL*	Korea
HO—HP†*	Panama
HQ—HR†*	Honduras
HS*	Thailand
HV*	Vatican
HZ	Saudi Arabia
I*	Italy
ISø, IMø*	Sardinia
J2*	Djibouti
J3†*	Grenada
J5	Guinea—Bissau
J6†*	St. Lucia
J7†*	Dominica
J8†*	St. Vincent & Dep.
JA—JS*	Japan
JD1[5]*	Minami Torishima
JD1[6]*	Ogasawara
JT—JV*	Mongolia
JW*	Svalbard
JX*	Jan Mayen
JY†*	Jordan
K,W,N, AA—AK	United States of America
KC6[28](E. Caroline Is.)	Micronesia
KC6[29](W. Caroline Is.)	Belau
KG4†*	Guantanamo Bay
KH1†	Baker, Howland Is.
KH2†*	Guam
KH3†	Johnston I.
KH4†*	Midway Is.
KH5†	Palmyra, Jarvis Is.
KH5K†	Kingman Reef
KH6†*	Hawaiian Is.
KH7†	Kure I.
KH8†*	American Samoa
KH9†	Wake I.
KHø†*	Mariana Is.
KL7†*	Alaska
KP1†	Navassa I.
KP2†*	Virgin Is.
KP4†*	Puerto Rico
KP5[27]†	Desecheo Is.
KX6*	Marshall Is.
LA—LN*	Norway
LO—LW†*	Argentina
LX*	Luxembourg
LZ*	Bulgaria
OA—OC†*	Peru
OD*	Lebanon
OE*	Austria
OF—OI*	Finland
OHø*	Aland Is.
OJø*	Market Reef
OK–OM*	Czechoslovakia
ON—OT*	Belgium
OX*	Greenland
OY*	Faroe Is.
OZ*	Denmark
P2[7]*	Papua New Guinea
P4*[31]	Aruba
PA—PI*	Netherlands
PJ2,4,9*	Bonaire, Curacao(Neth. Antilles)
PJ5—8*	St. Maarten, Saba, St. Eustatius
PP—PY†*	Brazil
PPø—PYø†*	Fernando de Noronha
PPø—PYø†*	St. Peter & St. Paul Rocks
PPø—PYø†*	Trindade & Martin Vaz. Is.
PZ*	Suriname
S2*	Bangladesh
S7*	Seychelles
S9	Sao Tome & Principe
Sø[1,32]	Western Sahara
SA—SM*	Sweden
SN—SR*	Poland
ST*	Sudan
STø*	Southern Sudan
SU*	Egypt
SV—SZ*	Greece
SV5*	Dodecanese
SV9*	Crete
SV/A*	Mount Athos
T2[16]	Tuvalu
T3ø	W. Kiribati (Gilbert & Ocn Is.)
T31	C. Kiribati (Brit. Phoenix Is.)
T32	East Kiribati (Line Is.)
T5	Somalia
T7*	San Marino

TA—TC*	Turkey
TF*	Iceland
TG, TD†*	Guatemala
TI,TE†*	Costa Rica
TI9†*	Cocos I.
TJ	Cameroon
TK*	Corsica
TL[8]	Central African Rep.
TN[9]	Congo
TR[10]	Gabon
TT[11]	Chad
TU[12]	Ivory Coast
TY[13]	Benin
TZ[14]	Mali
UA1,3,4,6*	European Russian R.S.F.S.R.
UA1*	Franz Josef Land
UA2*	Kaliningrad
UA9,ø*	Asiatic R.S.F.S.R.
UB, UT, UY*	Ukraine
UC*	Byelorussia
UD*	Azerbaijan
UF*	Georgia
UG*	Armenia
UH*	Turkmenistan
UI*	Uzbekistan
UJ*	Tadzhikistan
UL*	Kazakhstan
UM*	Kirghizia
UO*	Moldavia
UP*	Lithuania
UQ*	Latvia
UR*	Estonia
V2†*	Antigua & Barbuda
V3†*	Belize
V4[15]†	St. Christopher & Nevis
V8*	Brunei
VE, VO, VY†*	Canada
VK†*	Australia
VK†*	Lord Howe I.
VK9†*	Willis I.
VK9†*	Christmas I.
VK9†*	Cocos—Keeling Is.
VK9†*	Mellish Reef
VK9†*	Norfolk I.
VKø†*	Heard I.
VKø†*	Macquarie I.
VP2E[15]	Anguilla
VP2M[15]*	Montserrat
VP2V[15]*	Br. Virgin Is.
VP5*	Turks & Caicos Is.
VP8*	Falkland Is.
VP8, LU*	South Georgia I.
VP8, LU*	South Orkney Is.
VP8, LU*	South Sandwich Is.
VP8,CE9,HFø,LU,4K1*	South Shetland Is.
VP9*	Bermuda
VQ9*	Chagos
VR6†	Pitcairn I.
VS6*	Hong Kong
VU*	India
VU*	Andaman & Nicobar Is.
VU*	Laccadive Is.
XA—XI†*	Mexico
XA4—XI4*	Revilla Gigedo
XT[17]	Burkina Faso
XU	Kampuchea
XW	Laos
XX9	Macao
XY—XZ	Burma
Y2—9[3]*	German Dem. Rep.
YA	Afghanistan
YB—YH[21]*	Indonesia
YI*	Iraq
YJ*	Vanuatu
YK*	Syria
YN†*	Nicaragua
YO—YR*	Romania
YS†*	El Salvador
YT—YU, YZ*	Yugoslavia
YV—YY†*	Venezuela
YVø†*	Aves I.
Z2*	Zimbabwe
ZA	Albania
ZB2*	Gibraltar
ZC4*[30]	UK Sov. Base Areas on Cyprus
ZD7	St. Helena
ZD8*	Ascension I.
ZD9	Tristan da Cunha & Gough I
ZF*	Cayman Is.
ZK1*	So. Cook Is.
ZK1*	No. Cook Is.
ZK2	Niue
ZK3	Tokelau Is.
ZL—ZM*	New Zealand
ZL7*	Chatham Is.
ZL8*	Kermadec Is.
ZL9*	Auckland I. & Campbell I.
ZP†*	Paraguay
ZR—ZU*	South Africa
ZR2—ZU2*	Prince Edward & Marion Is.
ZR3—ZU3*	(Namibia) S.W. Africa
1Aø[1]	Sov. Mil. Order of Malta
1S[1]	Spratly Is.
3A*	Monaco
3B6,7*	Agalega & St. Brandon
3B8*	Mauritius
3B9*	Rodriguez I.
3C	Equatorial Guinea
3Cø	Pagalu I.
3D2*	Fiji
3D6†*	Swaziland
3V	Tunisia
3W,XV	Vietnam
3X	Guinea
3Y*	Bouvet
3Y*	Peter I.
4J1	Malyj Vystotkij Is
4P—4S*	Sri Lanka
4U†*	ITU Geneva
4U	HQ, United Nations
4W	Yemen
4X, 4Z†*	Israel
5A	Libya
5B*	Cyprus
5H—5I	Tanzania
5N—5O*	Nigeria
5R—5S	Madagascar
5T[18]*	Mauritania
5U[19]	Niger
5V*	Togo
5W*	Western Samoa
5X	Uganda
5Y—5Z*	Kenya
6V—6W[20]	Senegal
6Y†*	Jamaica
7O	People's Dem. Rep. Of Yemen
7P*	Lesotho
7Q	Malawi
7T—7Y*	Algeria
8P*	Barbados
8Q	Maldive Is.
8R†*	Guyana
9G[22]†	Ghana
9H*	Malta
9I—9J*	Zambia
9K*	Kuwait
9L†*	Sierra Leone
9M2, 4[23]*	West Malaysia
9M6,8[23]*	East Malaysia
9N	Nepal
9Q—9T*	Zaire
9U[24]	Burundi
9V[25]*	Singapore
9X[24]*	Rwanda
9Y—9Z†*	Trinidad & Tobago
J2/A*	Abu Ail, Jabal at Tair

Notes

[1]Unofficial prefix.

[2](DA—DL) Only contacts made September 17, 1973, and after, count for this country.

[3](Y2—9) Only contacts made September 17, 1973, and after, count for this country.

[4](FR) Only contacts made June 25, 1960, and after, count for this country.

[5](JD, KA1) Formerly Marcus Island

[6](JD, KA1) Formerly Bonin and Volcano Islands.

[7](P2) Only contacts made September 16, 1975, and after, count for this country.

[8](TL) Only contacts made August 13, 1960, and after, count for this country.

[9](TN) Only contacts made August 15, 1960, and after, count for this country.

[10](TR) Only contacts made August 17, 1960, and after count for this country

[11](TT) Only contacts made August 11, 1960, and after, count for this country.

[12](TU) Only contacts made August 7, 1960, and after, count for this country.

[13](TY) Only contacts made August 1, 1960, and after, count for this country.

[14](TZ) Only contacts made June 20, 1960, and after, count for this country.

[15](VP2) For DXCC credit for contacts made May 31, 1958 and before, see page 97, June 1958 QST.

[16](T2,VR8) Only contacts made January 1, 1976 and after, count for this country.

[17](XT) Only contacts made August 5, 1960, and after, count for this country.

[18](5T) Only contacts made June 20, 1960,and after, count for this country.
[19](5U) Only contacts made August 3, 1960, and after, count for this country.
[20](6W) Only contacts made June 20, 1960, and after, count for this country.
[21](8F, YB) Only contacts made May 1, 1963, and after, count for this country.
[22](9G) Only contacts made March 5, 1957, and after, count for this country.
[23](9M2,4,6,8) Only contacts made September 16, 1963, and after, count for this country.
[24](9U, 9X) Contacts made July 1, 1962, and after, count for this country.
[25](9V) Contacts made September 16, 1963 to August 8, 1965, count for West Malaysia.
[26](D6, FH8) Only contacts made July 5, 1975, and after, count for this country.
[27](KP5, KP4) Only contacts made March 1, 1979, and after, count for this country.
[28](KC6) Includes Yap Is. January 1, 1981, and after.
[29](KC6) Includes Yap Is. December 31, 1980, and before.
[30](ZC4) Only contacts made August 16, 1960, and after, count for this country.
[31](P4) Only contacts made January 1, 1986, and after, count for this country.
[32]Contacts with Rio de Oro (Spanish Sahara), EA9, also count for this country.
▲Also ATø, DPø, FT8Y, LU, OR4, VKø, VP8, Y8, ZL5, ZS1, ZXø, 3Y, 4K1, 8J1, etc. QSL via country under whose auspices the particular station is operating. The availability of a third—party traffic agreement and a QSL Bureau applies to the country under whose auspices the particular station is operating.

Deleted Countries

Credit for any of these countries can be given if the date of contact with the country in question agrees with the date(s) shown in the corresponding footnote.

Prefix	Country
AC3[1,2]	Sikkim
AC4[1,3]	Tibet
C9[4]	Manchuria
CN2[5]	Tangier
CR8[6]	Damao, Diu
CR8[6]	Goa
CR8, CR10[7]	Portuguese Timor
DA—DM[8]	Germany
EA9[9]	Ifni
ET2[10]	Eritrea
FF[11]	Fr. West Africa
FH, FB8[12]	Comoros
FI8[13]	Fr. Indo—China
FN8[14]	French India
FQ8[15]	Fr. Equatorial Africa
HKø[16]	Bajo Nuevo
HKø, KP3, KS4[16]	Serrana Bank & Roncador Cay
I1[17]	Trieste
I5[18]	Italian Somaliland
JD1/7J1[19]	Okino Tori—shima
JZø[20]	Netherlands N. Guinea
KR6,8,JR6,KA6[21]	Okinawa (Ryukyu Islands)
KS4[22]	Swan Islands
KZ5[23]	Canal Zone
P2,VK9[24]	Papua Territory
P2,VK9[24]	Terr. New Guinea
PK1—3[25]	Java
PK4[25]	Sumatra
PK5[25]	Netherlands Borneo
PK6[25]	Celebe & Molucca Is.
UN1[26]	Karelo—Finish Rep.
VO[27]	Newfoundland, Labrador
VQ1,5H1[28]	Zanzibar
VQ6[29]	British Somalliland
VQ9[30]	Aldabra
VQ9[30]	Desroches
VQ9[30]	Farquhar
VS2, 9M2[31]	Malaya
VS4[31]	Sarawak
VS9H[32]	Kuria Muria I.
ZC5[31]	British North Borneo
ZC6, 4X1[33]	Palestine
ZD4[34]	Gold Coast, Togoland
1M[1,35]	Minerva Reef
7O/VS9K[26]	Kamaran Is.
8Z4[37]	Saudi Arabia/Iraq Neutral Zone
8Z5, 9K3[38]	Kuwait/Saudi Arabia Neutral Zone
9S4[39]	Saar
9U5[40]	Ruanda—Urundi
[41]	Blenheim Reef
[42]	Geyser Reef

Notes

[1] Unofficial prefix.
[2](AC3) Only contacts made April 30, 1975, and before, count for this country. Contacts made May 1, 1975, and after count as India (VU).
[3](AC4) Only contacts made May 30, 1974, and before, count for this country. Contacts made May 31, 1974, and after count as China (BY).
[4](C9) Only contacts made September 15, 1963, and before, count for this country. Contacts made September 16, 1983, and after count as China (BY).
[5](CN2) Only contacts made June 30, 1960 and before, count for this country. Contacts made July 1, 1960, and after count as Morocco (CN).
[6](CR8) Only contacts made December 31, 1962, and before, count for this country.
[7](CR8, CR10) Only contacts made September 14, 1976, and before, count for this country.
[8](DA—DM) Only contacts made September 16, 1973, and before, count for this country. Contacts made September 17, 1973, and after count as either FRG (DA—DL) or GDR (Y2—Y9).
[9](EA9) Only contacts made May 13, 1969, and before, count for this country.
[10](ET2) Only contacts made November 14, 1962, and before, count for this country. Contacts made November 15, 1962, and after, count as Ethiopia (ET).
[11](FF) Only contacts made August 6, 1960, and before, count for this country.
[12](FH, FB8) Only contacts made July 5, 1975 and before, count for this country. Contacts made July 6, 1975, and after, count as Comoros (D6) or Mayotte (FH)
[13](FI8) Only contacts made December 20, 1950, and before, count for this country.
[14](FN8) Only contacts made October 31, 1954 and before, count for this country.
[15](FQ8) Only contacts made August 16, 1960, and before, will count for this country.
[16](HKø, KP3, KS4) Only contacts made September 16, 1981, and before, count for this country. Contacts made September 17, 1981, and after, count as San Andres (HKø).
[17](I1) Only contacts made March 31, 1957, and before, count for this country. Contacts made April 1, 1957, and after count as Italy (I).
[18](I5) Only contacts made June 30, 1960 and before, count for this country.
[19](JD1/7J1) Only contacts made from May 30, 1976, to November 30, 1980 count for this country. Contacts made December 1, 1980, and after, count as Ogasawara (JD1).
[20](JZø) Only contacts made April 30, 1963 and before, count for this country.
[21](KR6,9,JR6, KA6) Only contacts made May 14, 1972, and before, count for this country. Contacts made May 15, 1972, and after, count as Japan (JA).
[22](KS4) Only contacts made August 31, 1972, and before, count for this country. Contacts made September 1, 1972, and after count as Honduras (HR).
[23](KZ5) Only contacts made September 30, 1979, and before, count for this country.
[24](P2, VK9) Only contacts made September 15, 1975 and before, count for this country. Contacts made September 16, 1975, and after count as Papua New Guinea (P2).
[25](PK1—6) Only contacts made April 30, 1963 and before, count for this country. Contacts made May 1, 1963, and after count as Indonesia. (YB).
[26](UN1) Only contacts made June 30, 1960, and before, count for this country. Contacts made July 1, 1960, and after, count as European RSFSR (UA).
[27](VO) Only contacts made March 31, 1949, and before, count for this country.
Contacts made April 1, 1949, and after, count as Canada (VE).

[28](VQ1, 5H1) Only contacts made May 31, 1974 and before, count for this country. Contacts made June 1, 1974, and after, count as Tanzania (5H).

[29](VQ6) Only contacts made June 30, 1960, and before, count for this country.

[30](VQ9) Only contacts made June 28, 1976, and before, count for this country. Contacts made June 29, 1976, and after, count as Seychelles (S7).

[31](VS2, VS4, ZC5, 9M2) Only contacts made September 15, 1963, and before, count for this country. Contacts made September 16, 1963, and after, count as West Malaysia (9M2) or East Malaysia (9M6,8).

[32](VS9H) Only contacts made November 29, 1967, and before, count for this country.

33(ZC6, 4X1) Only contacts made June 30, 1968, and before, count for this country. Contacts made July 1, 1968, and after count as Israel (4X).

[34](ZD4) Only contacts made March 5, 1957 and before, count for this country.

[35](1M) Only contacts made July 15, 1972, and before, count for this country. Contacts made July 16, 1972, and after count as Tonga (A3).

[36](7O/VS9K) Only contacts made March 10, 1982, and before, count for this country.

[37](8Z4) Only contacts made December 25, 1981, and before, count for this country.

[38](8Z5, 9K3) Only contacts made December 14, 1969, and before, count for this country.

[39](9S4) Only contacts made March 31, 1957, and before, count for this country.

[40](9U5) Only contacts made from July 1, 1960 to June 30, 1962 count for this country. Contacts made July 1, 1962, and after, count as Burundi (9U) or Rwanda (9X).

[41](Blenheim Reef) Only contacts made from May 4, 1967 to June 30, 1975, count for this country. Contacts made July 1, 1975, and after, count as Chagos (VQ9).

[42](Geyser Reef) Only contacts made from May 4, 1967, to February 28, 1978, count for this country.

Prefix Cross References

A8 = EL
AC (before 1972) = A5
AH = KH
AL7 = KL7
AM - AO = EA
AT - AW = VU
AX = VK
AY - AZ = LU
CF - CK = VE
CL= CO
CQ - CS = CT
CR3 (before 1974) = J5
CR4 (before 1976) = D4
CR5 (before 1976) = S9
CR6 (before 1976) = D2
CR7 (before 1976) = C9
CR9 (before 1985) = XX9
CT2 (before 1986) = CU
CXø = CE9/VP8
CY—CZ = VE
CY9 (before 1985) = CYø
DM-DT (before 1980) = Y2 - 9
EAø (before 1969) = 3C
EK, EM—EO, ER—ES, EU—EZ = U
FA—FF (after 1981) = F
FA (before 1963) = 7X
FB8 (before 1961) = 5R
FB8 (before 1985) = FT
FC (before 1985) = TK
FD8 (before 1961) = 5V
FE8 (before 1961) = TJ
FL (before 1978) = J2
FU8 (before 1982) = YJ
GB = G
GC (before 1977) = GJ/GU
H2 = 5B
H3 = HP
H5 (Bophutatswana) = ZS
H7 = YN
HE = HB
HM (before 1982) = HL
HT = YN
HU = YS
HW—HY = F
J4 = SV
KA1 = JD1
KA2AA—KA8ZZ = JA
KB6 (before 1979) = KH1
KC4 (Navassa) = KP1
KG6 (before 1979) = KH2
KG6I (before 1970) = JD1
KG6R, S,T (before 1979) = KHø
KJ6 (before 1979) = KH3
KM6 (before 1979) = KH4
KP4 (Desecheo) = KP5
KP6 (before 1979) = KH5
KS6 (before 1979) = KH8
KV4 (before 1979) = KP2
KW6 (before 1979) = KH9
L2—9 = LU
LY = UP
M1 (before 1984) = T7
MP4B (before 1972) = A9
MP4M (before 1972) = A4
MP4Q (before 1972) = A7
MP4T, D (before 1972) = A6
NH = KH
NL7 = KL7
NP = KP
OQ (before 1961) = 9Q
P4 (before 1986) = PJ
PX (before 1970) = C3
RA, RN = UA
RB—RR = UB—UR
RS—RZ = U
S4 (Ciskei) = ZS
S8 (Transkei) = ZS
T4 = CO
T4 (Venda) = ZS
TH, TM, TO—TQ, TV—TX = F
UN, UV, UW, UZ = UA
V9 (Venda) = ZS
VA—VG = VE
VH—VN = VK
VK9 (Nauru) = C2
VP1 (before 1982) = V3
VP2A (before 1982) = V2
VP2D (before 1979) = J7
VP2G (before 1975) = J3
VP2K (before 1984) = V4 or VP2E
VP2L (before 1980) = J6
VP2S (before 1980) = J8
VP3 (before 1967) = 8R
VP4 (before 1963) = 9Y
VP5 (Jamaica) = 6Y
VP6 (before 1967) = 8P
VP7 (before 1974) = C6
VQ2 (before 1965) = 9J
VQ3 (before 1962) = 5H
VQ4 (before 1964) = 5Z
VQ5 (before 1963) = 5X
VQ8 (before 1969) = 3B
VQ8 (Chagos) = VQ9
VQ9 (Seychelles) = S7
VR1 (before 1980) = T3/31
VR2 (before 1971) = 3D2
VR3 (before 1980) = T32
VR4 (before 1979) = H4
VR5 (before 1971) = A3
VR8 (before 1979) = T2
VS1 (before 1966) = 9V
VS5 (before 1985) = V8
VS7 (before 1949) = 4S
VS9A, P, S (Before 1968) = 70
VS9M = 8Q
VS90 (before 1961) = A4
VX-VY = CY/VE
WH - KH
WL7 = KL7
WP - KP
XJ-XO = VE
XP=OX
XQ-XR = CE
XV -3W
XX7 (before 1976) = C9
YL = UQ
ZB1 (before 1965) = 9H
ZD1 (before 1962) = 9L
ZD2 (before 1961) = 5N
ZD3 (before 1966) = C5
ZD4 (before 1958) = 9G
ZD5 (before 1969) = 3D6
ZD6 (before 1965) = 7Q
ZE (before 1981) = Z2-9
ZK9 (1983) = ZK2
ZM6 (before 1963) = 5W
ZM7 (before 1984) = ZK3
ZS7 (before 1969) = 3D6
ZS8 (before 1967) = 7P
ZS9 (before 1967) = A2
ZV-ZZ = PY
3B-3C (before 1968) = VE

3G = CE
3Z = SP
4A-4C = XE
4D-41 = DU
4J-4L = U
4M = YV
4N-4O = YU
4T = OA
4U1VIC = OE
4V = HH
5J-5K = HK
5L-5M =EL
6C = YK
6D-6J = XE
6O = T5
6T-6U = ST
7A-7I = YB
7G (before 1967) = 3X
7J-7N = JA, JD
7S = SM
7Z = HZ
8A-8I = YB
8J-8N = JA
8O = A2
8S = SM
9A (before 1984) = T7
9B-9D = EP
9E-9F = ET

Allocation of International Call Signs

Call Sign Series	Allocated to
AAA-ALZ	United States of America
AMA-AOZ	Spain
APA-ASZ	Pakistan (Islamic Republic of)
ATA-AWZ	India (Republic of)
AXA-AXZ	Australia
AYA-AZZ	Argentine Republic
A2A-A2Z	Botswana (Republic of)
A3A-A3Z	Tonga (Kingdom of)
A4A-A4Z	Oman (Sultanate of)
A5A-A5Z	Bhutan (Kingdom of)
A6A-A6Z	United Arab Emirates
A7A-A7Z	Qatar (State of)
A8A-A8Z	Liberia (Republic of)
A9A-A9Z	Bahrain (State of)
BAA-BZZ	China (People's Republic of)
CAA-CEZ	Chile
CFA-CKZ	Canada
CLA-CMZ	Cuba
CNA-CNZ	Morocco (Kingdom of)
COA-COZ	Cuba
CPA-CPZ	Bolivia (Republic of)
CQA-CUZ	Portugal
CVA-CXZ	Uruguay (Oriental Republic of)
CYA-CZZ	Canada
C2A-C2Z	Nauru (Republic of)
C3A-C3Z	Andorra (Principality of)
C4A-C4Z	Cyprus (Republic of)
C5A-C5Z	Gambia (Republic of the)
C6A-C6Z	Bahamas (Commonwealth of the)
C7A-C7Z*	World Meteorological Organisation
C8A-C9Z	Mozambique (People's Republic of)
DAA-DRZ	Germany (Federal Republic of)
DSA-DTZ	Republic of Korea
DUA-DZZ	Philippines (Republic of the)
D2A-D3Z	Angola (People's Republic of)
D4A-D4Z	Cape Verde (Republic of)
D5A-D5Z	Liberia (Republic of)
D6A-D6Z	Comoros (Federal and Islamic Republic of the)
D7A-D9Z	Republic of Korea
EAA-EHZ	Spain
EIA-EJZ	Ireland
EKA-EKZ	Union of Soviet Socialist Republics
ELA-ELZ	Liberia (Republic of)
EMA-EOZ	Union of Soviet Socialist Republics
EPA-EQZ	Iran (Islamic Republic of)
ERA-ESZ	Union of Soviet Socialist Republics
ETA-ETZ	Ethiopia
EUA-EWZ	Byelorussian Soviet Socialist Republic
EXA-EZZ	Union of Soviet Socialist Republics
FAA-FZZ	France
GAA-GZZ	United Kingdom of Great Britain and Northern Ireland
HAA-HAZ	Hungarian People's Republic
HBA-HBZ	Switzerland (Confederation of)
HCA-HDZ	Ecuador
HEA-HEZ	Switzerland (Confederation of)
HFA-HFZ	Poland (People's Republic of)
HGA-HGZ	Hungarian People's Republic
HHA-HHZ	Haiti (republic of)
HIA-HIZ	Dominican Republic
HJA-HKZ	Colombia (Republic of)
HLA-HLZ	Republic of Korea
HMA-HMZ	Democratic People"s Republic of Korea
HNA-HNZ	Iraq (Republic of)
HOA-HPZ	Panama (Republic of
HQA-HRZ	Honduras (Republic of)
HSA-HSZ	Thailand
HTA-HTZ	Nicaragua
HUA-HUZ	El Salvador (Republic of)
HVA-HVZ	Vatican City State
HWA-HYZ	France
HZA-HZZ	Saudi Arabia (Kingdom of)
H2A-H2Z	Cyprus (Republic of)
H3A-H3Z	Panama (Republic of)
H4A-H4Z	Solomon Islands
H6A-H7Z	Nicaragua
H8A-H9Z	Panama (Republic of)
IAA-IZZ	Italy
JAA-JSZ	Japan
JTA-JVZ	Mongolia People's Republic
JWA-JXZ	Norway
JYA-JYZ	Jordan (Hashemite Kingdom of)
JZA-JZZ	Indonesia (Republic of)
J2A-J2Z	Dijibouti (Republic of)
J3A-J3Z	Grenada
J4A-J4Z	Greece
J5A-J5Z	Guinea-Bissau (Republic of)
J6A-J6Z	Saint Lucia
J7A-J7Z	Dominica
J8A-J8Z	St Vincent and the Grenadines
KAA-KZZ	United States of America
LAA-LNZ	Norway
LOA-LWZ	Argentina (Republic of)
LXA-LXZ	Luxembourg
LYA-LYZ	Union of Soviet Socialist Republics
LZA-LZZ	Bulgaria (People's Republic of)
L2A-L9Z	Argentina (republic of)
MAA-MZZ	United Kingdom of Great Britain and Northern Ireland
NAA-NZZ	United States of America
OAA-OCZ	Peru
ODA-ODZ	Lebanon
OEA-OEZ	Austria
OFA-OJZ	Finland
OKA-OMZ	Czechoslovak Socialist Republic
ONA-OTZ	Belgium
OUA-OZZ	Denmark
PAA-PIZ	Netherlands (Kingdom of the)
PJA-PJZ	Netherlands Antilles
PKA-POZ	Indonesia (Republic of)
PPA-PYZ	Brazil (Federative Republic of)
PZA-PZZ	Suriname (Republic of)
P2A-P2Z	Papua New Guinea
P3A-P3Z	Cyprus (Republic of)
P4A-P4Z	Aruba
P5A-P9Z	Democratic People's Republic of Korea
QAA-QZZ	(Service abbreviations)
RAA-RZZ	Union of Soviet Socialist Republics
SAA-SMZ	Sweden
SNA-SRZ	Poland (People's Republic of)
SSA-SSM	Egypt (Arab Republic of)
SSN-STZ	Sudan (Democratic Republic of the)
SUA-SUZ	Egypt (Arab Republic of)
SVA-SZZ	Greece
S2A-S3Z	Bangladesh (People's Republic of)
S6A-S6Z	Singapore (Republic of)
S7A-S7Z	Seychelles (Republic of)
S9A-S9Z	Sao Tome and Principe (Democratic Republic of)
TAA-TCZ	Turkey
TDA-TDZ	Guatemala (Republic of)
TEA-TEZ	Costa Rica
TFA-TFZ	Iceland
TGA-TGZ	Guatemala (Republic of)
THA-THZ	France
TIA-TIZ	Costa Rica
TJA-TJZ	Cameroon (United Republic of)
TKA-TKZ	France
TLA-TLZ	Central African Republic
TMA-TMZ	France
TNA-TNZ	Congo (People's Republic of the)
TOA-TQZ	France
TRA-TRZ	Gabon Republic
TSA-TSZ	Tunisia
TTA-TTZ	Chad (Republic of
TUA-TUZ	Ivory Coast (Republic of the)
TVA-TXZ	France
TYA-TYZ	Benin (People's Republic of)
TZA-TZZ	Mali (Republic of)
T2A-T2Z	Tuvalu
T3A-T3Z	Kiribati Republic
T4A-T4Z	Cuba
T5A-T5Z	Somali Democratic Republic
T6A-T6Z	Afghanistan (Democratic Republic of)
T7A-T7Z	San Marino (Republic of)
UAA-UQZ	Union of Soviet Socialist Republics
URA-UTZ	Ukrainian Soviet Socialist Republic
UUA-UZZ	Union of Soviet Socialist Republics
VAA-VGZ	Canada
VHA-VNZ	Australia
VOA-VOZ	Canada
VPA-VSZ	United Kingdom of Great Britain and Northern Ireland
VTA-VWZ	India (Republic of)
VXA-VYZ	Canada
VZA-VZZ	Australia
V2A-V2Z	Antigua and Barbuda
V3A-V3Z	Belize
V4A-V4Z	St Christopher and Nevis
V8A-V8Z	Brunei
WAA-WZZ	United States of America
XAA-XIZ	Mexico
XJA-XOZ	Canada
XPA-XPZ	Denmark
XQA-XRZ	Chile
XSA-XSZ	China (People's Republic of)
XTA-XTZ	Burkina Faso

XUA-XUZ Democratic Kampuchea
XVA-XVZ Viet Nam (Socialist Republic of)
XWA-XWZ Lao People's Democratic Republic
XXA-XXZ Portugal
XYA-XZZ Burma (Socialist Republic of the Union of)
YAA-YAZ Afghanistan (Democratic Republic of)
YBA-YHZ Indonesia (Republic of)
YIA-YIZ Iraq (Republic of)
YJA-YJZ New Hebrides
YKA-YKZ Syrian Arab Republic
YLA-YLZ Union of Soviet Socialist Republics
YMA-YMZ Turkey
YNA-YNZ Nicaragua
YOA-YRZ Romania (Socialist Republic of)
YSA-YSZ El Salvador (Republic of)
YTA-YUZ Yugoslavia (Socialist Federal Republic of)
YVA-YYZ Venezuela (Republic of)
YZA-YZZ Yugoslavia (Socialist Federal Republic of)
Y2A-Y9Z German Democratic Republic
ZAA-ZAZ Albania (Socialist People's Republic of)
ZBA-ZJZ United Kingdom of Great Britain and Northern Ireland
ZKA-ZMZ New Zealand
ZNA-ZOZ United Kingdom of Grreat Britain and Northern Ireland
ZPA-ZPZ Paraguay (Republic of)
ZQA-ZQZ United Kingdom of Great Britain and Northern Ireland
ZRA-ZUZ South Africa (Republic of)
ZVA-ZZZ Brazil (Federative Republic of)
Z2A-Z2Z Zimbabwe (Republic of)
2AA-2ZZ United Kingdom of Great Britain and Northern Ireland
3AA-3AZ Monaco
3BA-3BZ Mauritius
3CA-3CZ Equatorial Guinea (Republic of)
3DA-3DM Swaziland (Kingdom of)
3DN-3DZ Fiji
3EA-3FZ Panama (Republic of)
3GA-3GZ Chile
3HA-3UZ China (People's Republic of)
3VA-3VZ Tunisia
3WA-3WZ Viet Nam (Socialist Republic of)
3XA-3XZ Guinea (People's Revolutionary Republic of)
3YA-3YZ Norway
3ZA-3ZZ Poland (People's Republic of)
4AA-4CA Mexico
4DA-4IZ Philippines (Republic of the)
4JA-4LZ Union of Soviet Socialist Republics
4MA-4MZ Venezuela (Republic of)
4NA-4OZ Yugoslavia (Socialist Federal Republic of)
4PA-4SZ Sri Lanka (Democratic Socialist Republic of)
4TA-4TZ Peru
4UA-4UZ* United Nations Organization
4VA-4VZ Haiti (Republic of)
4WA-4WZ Yemen Arab Republic
4XA-4XZ Israel (State of)
4YA-4YZ* International Civil Aviation Organization
4ZA-4ZZ Israel (State of)
5AA-5AZ Libya (Socialist People's Libyan Arab Jamahiriya)
5BA-5BZ Cyprus (Republic of)
5CA-5GZ Morocco (Kingdom of)
5HA-5IZ Tanzania (United Republic of)
5JA-5KZ Colombia (Republic of)
5LA-5MZ Liberia (Republic of)
5NA-5OZ Nigeria (Federal Republic of)
5PA-5QZ Denmark
5RA-5SZ Madagascar (Democratic Republic of)
5TA-5TZ Mauritania (Islamic Republic of)
5UA-5UZ Niger (Republic of the)
5VA-5VZ Togolese Republic
5WA-5WZ Western Samoa
5XA-5XZ Uganda (Republic of)
5YA-5ZZ Kenya (Republic of)
6AA-6BZ Egypt (Arab Republic of)
6CA-6CZ Syrian Arab Republic
6DA-6JZ Mexico
6KA-6NZ Republic of Korea
6OA-6OZ Somali Democratic Republic
6PA-6SZ Pakistan (Islamic Republic of)
6TA-6UZ Sudan (Democratic Republic of the)
6VA-6WZ Senegal (Republic of the)
6XA-6XZ Madagascar (Democratic Republic of)
6YA-6YZ Jamaica
6ZA-6ZZ Liberia (Republic of)
7AA-7IZ Indonesia (Republic of)
7JA-7NZ Japan
7OA-7OZ Yemen (People's Democratic Republic of)
7PA-7PZ Lesotho (Kingdom of)
7QA-7QZ Malawi (Republic of)
7RA-7RZ Algeria (Algerian Democratic and Popular Republic)
7SA-7SZ Sweden
7TA-7YZ Algeria (Algerian Democratic and Popular Republic)
7ZA-7ZZ Saudi Arabia (Kingdom of)
8AA-8IZ Indonesia (Republic of)
8JA-8NZ Japan
8OA-8OZ Botswana (Republic of)
8PA-8PZ Barbados
8QA-8QZ Maldives (Republic of)
8RA-8RZ Guyana
8SA-8SZ Sweden
8TA-8YZ India (Republic of)
8ZA-8ZZ Saudi Arabia (Kingdom of)
9BA-9DZ Iran (Islamic Republic of)
9EA-9FZ Ethiopia
9GA-9GZ Ghana
9HA-9HZ Malta (Republic of)
9IA-9JZ Zambia (Republic of)
9KA-9KZ Kuwait (State of)
9LA-9LZ Sierra Leone
9MA-9MZ Malaysia
9NA-9NZ Nepal
9OA-9TZ Zaire (Republic of)
9UA-9UZ Burundi (Republic of)
9VA-9VZ Singapore (Republic of)
9WA-9WZ Malaysia
9XA-9XZ Rwanda (Republic of)
9YA-9ZZ Trinidad and Tobago

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ABBREVIATIONS FOR CW WORK

AA	After All
AB	All Before
ABT	About
ADR, ADS	Address
AGN	Again
ANT	Antenna
AR K	End of transmission
AR VA	Final end of transmission
AS	Wait
BCI	Broadcast interference
BCL	Broadcast listener
BK	Break; I wish to break—in (interrupt) a transmission in progress
BN	All between; been
BUG	Semi—automatic key
B4	Before
C	Yes
CFM	Confirm; I confirm
CK	Check
CL	I am closing my station; call
CLD, CLG	Called; Calling
CPI, CPY	Copy
CQ	Calling any station
CS	Callsign
CT	Commence traffic
CUAGN	See you again
CUD	Could
CUL	See you later
CW	Continuous wave, ie, radio telegraphy
DE	From
DLD, DLVD	Delivered
DR	Dear
DX	Distance, foreign countries
ER	Here

ES	And; &
FB	Fine business, excellent
FER	For
FM	Frequency modulation; From
GA	Go ahead, continue sending: good afternoon
GB	Goodbye
GBA	Give better address
GE	Good evening
GG	going; grounded grid
GM	Good morning
GN	Good night
GND	Ground
GUD	Good
HI	Laughter; High
HPE	Hope
HR	Here; Hear; Hour
HV; HVE	Have
HW	How
K	Go ahead
KN	specific station go ahead
LID	A poor operator
MA; MILS	Milliamperes
MNI	Many
MSG	Message
N	No; North
NCS	Net control station
ND	Nothing doing
NIL	Nothing: I have nothing for you
NM	No more
NR	Number
NW	Now
OB	Old boy
OC	Old chap
OG	Old girl
OM	Old man
OP; OPR	Operator
OT	Old timer; Old top
PBL	Preamble
PSE; PLSE	Please
PWR	Power
PX	Press
R	Received as transmitted; are (sometimes also used as a decimal point, eg 1R5)
RCD, RCVD	Received
RCVR; RX	Receiver
REF	Refer to; Referring to; Reference
RFI	Radio frequency interference
RIG	Station equipment
RPRT; REPT	Report
RPT	Repeat; I repeat
RTT; RTTY	Radio teletype
RX; RCVR	Receiver
SA	Say
SASE	Self-addressed, stamped envelope
SED	Said
SIG	Signal
SINE	Operator's personal initials or nickname
SKED	Schedule
SRI	Sorry
SSB	Single sideband
SUM	Some
SVC	Service
T	Zero (ø)
TFC	Traffic
THO	Though
THRU; THRO	Through
TNX; TKs	Thanks
TT	That
TU;TKU	Thank you
TVI	Television interference
TX	Transmitter
TXT	Text
U	You
UR	Your; You are (sometimes YR)
URS	Yours (sometimes YRS)
VFO	Variable frequency oscillator
VY	Very
WA	Word after
WB	Word before
WD; WDS	Word; Words
WID	With
WKD; WKG	Worked; Working
WL	Well;Will
WUD	Would
WX	Weather
XCVR	Transceiver
XMTR; TX	Transmitter
XTAL	Crystal
XYL; YF	Wife
YL	Young lady
73	Best regards
88	Love and kisses

ar

ARTICLES ON EMC

Continued from page 36

	Of Modulation Interference (TVI, BCI, AFI, ETC)! External — Internal Modulation
September 1984	"EMI — UK—EMC"
October 1984	Auto—EMI/EMC
November 1984	Corona Discharge Power Line Interference.
December 1984	The Role Of Integrated Circuits Decoupling In Electromagnetic Compatibility.
Jan 1986	75 Ohm High Pass Filter.
September 1986	Amateur Radio And Electro—Magnetic Compatibility.
October 1986	(Comments On EMC Matters).
November 1986	TVA Cases And How They Were Solved In DL And Not In VK..
December 1986	TV Receiver Design In West Germany With High Immunity. . . . Coaxial Cable Stubs As Filters.
January 1987	Testing Of VCRs, And The RF Field Strength Around The Amateur Station And House.
February 1987	From Here And There, Jack Ravenscroft VE3SR—QRT!
March 1987	Shielding: The Lost Art.
May 1987	Equal Duties, Equal Rights.
June 1987	TV & FM—BC—Pre—amplifiers And Their Problems.
July 1987	RFI Assistance List In Practice.
August 1987	RFI In Great Britain — Where Do We Stand In DL?
September 1987	Are We Alone? EMC Symposium In Europe.
October 1987	RF Leakage From Amateur Transmitters, Harmonics.
November 1987	Shielding, Earth Loops Filter Design Problems.
December 1987	An Effective High—Pass Filter.
January 1988	Buying An Appliance? You May Get RFI You Didn't Bargain For.
February 1988	What Can We Learn From An Improvised Jacky Test?
March 1988	EMC Advice Pamphlet For RSGB Members (Part 1).
April 1988	As Above (Part 2).
May 1988	EMC Test Of TV Sets And Typical Results.
June 1988	Radiation Immunity Of VCRs, VCI.
July 1988	A Law Is Only As Good As Its Policing Is Effective.
August 1988	Trouble With Hifi Equipment, TV Etc Equipment?
September 1988	Trouble With Hifi, TV And VCR Equipment, The Legal Position, Tips To Overcome Disagreements.
October 1988	Ferrite Core Choke Solves EMC Problem.
November 1988	The VE3SR Case

(List compiled by Hans Ruckert VK2AOU)ar

AWARDS

Odd awards

Federal Awards Manager
Ken Gott VK3AJU
38A Lansdowne Rd
St Kilda 3183

If you want to be the first in your street with some odd-ball awards, here's the book for you. How about the Monk's Beer Award of the Abbey of Glemboux (Belgium), the Onion Award of the Radio Society of Aalst (also in Belgium), the 1066 Award (from Hastings, naturally), or the 't Gooi Award (yes, that's what I said: 't Gooi Award). That one's from Holland.

(Listen mate, you've heard of an apostrophe s. Why shouldn't there be an apostrophe t, if the Dutch want one?)

The book is Amateur Radio Awards (2nd ed.) written, edited and distributed by G1TZU, Sue Squibb, 36 Frognal Gardens, Teynham, Sittingbourne, Kent ME9 9HU, UK.

It will cost you £5, US$10 or 20IRCs plus £3.22 airmail postage.

It lists some 300 awards for amateur radio (and most are available on a received basis to SWL too), giving succinct summaries of the conditions/rules, cost and addresses from which the award or application forms can be obtained. All awards on listed alphabetically in an index.

Amateur Radio Awards has obviously been prepared on a word processor, printed on only one side of the paper, and bound with a slide clip. Although this presentation makes it look far from professional, it has the very great advantages that revisions and corrections can be made quite easily and at little cost.

Sue G1TZU is to be congratulated on preparing this mammoth compilation of awards (it even includes the DX Widow Award administered by Maurie VK3XEX).

Sue's book received a brief mention in the November issue of AR on page 52, but I though it deserved a bigger review. besides, I've been able to quote you the cost of airmail postage.

The ARRL has kindly supplied a spelled-out list of its sections and those of the Canadian Radio Relay League (CRRL) which form the basis of the ARRL Diamond Jubilee Award, marking the 75th anniversary of the foundation of the ARRL in 1914.

Rules for winning this award were outlined in the January issue of AR but at that stage I only had a list of abbreviations for the ARRL and CRRL sections. Having worked in the USA for seven years, I was able to decipher most of them, but there were some some that had me puzzled. The spelled-out list appears below.

Eileen Sapko, ARRL Awards Manager, also responded promptly to my request for a sample copy of the Diamond Jubilee certificate. I can certify that it is a conspicuously handsome creation with a deep blue background at the top shading to magenta at the bottom. The award title is in red embossed script, and the ARRL logo is reproduced against a silver background. The certificate is made of sturdy card and measures 28 cm wide by 36 cm deep. An adornment ot any shack, as they say.

Unfortunately the certificate does not lend itself to reproduction in black-and-white printing, so you will have to take my word for its impressive design.

As mentioned in last month's AR, the qualification period for the award is calendar 1989, as defined in UCT.

American Radio Relay League and Canadian Radio Relay League Geographical "Sections" to be used in qualifying for ARRL Diamond Jubilee Award

1
Connecticut
Eastern Massachusetts
Maine
New Hampshire
Rhode Island
Vermont
Western Massachusetts
2
Eastern New York
New York City-Long Island
Northern New Jersey
Southern New Jersey
Western New York
3
Delaware
Eastern Pennsylvania
Maryland-DC
Western Pennsylvania
4
Alabama
Georgia
Kentucky
North Carolina
Northern Florida
Tennessee
Virginia
Virgin Island
5
Arkansas
Louisiana
Mississippi
New Mexico
North Texas
Oklahoma
South Texas
West Texas
6
East Bay
Los Angeles
Orange
Santa Barbara
Santa Clara Valley
San Diego
San Francisco
San Joaquin Valley
Sacramento Valley
Pacific
7
Arizona
Idaho
Montana
Nevada
Oregon
Utah
Washington
Wyoming
Alaska
8
Michigan
Ohio
West Virginia
9
Illinois
Indiana
Wisconsin
10
Colorado
Iowa
Kansas
Minnesota
Missouri
Nebraska
North Dakota
South Dakota
VE
Maritimes
Quebec
Ontario
Manitoba
Saskatchewan
Alberta
British Columbia
Yukon/Northwest Territories

It's been some time since AR published updates for DXCC rankings and names of

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winners of various WIA awards. Blame it on my settling in period being a little longer than I expected. DXCC updates appearing above were inherited from my prodecessor, Ken Hall VK5AKH. From now on, I'm on my own. I hope I do as well as he did. 3AJU

DXCC Updates

	CW	Phone	Open
4LC		311/346	
5AB		315/349	
5WO	201/208	313/338	314/342
2DTH		287	
6AJW		294/296	
5AB		316/350	
3AJU		125	
3JF	234/249		
3OT		302/306	305/309
5OU		281/293	
3CSR		282/285	
4BG		284/295	291/305 ar

VK2 MINIBULLETIN

New Administrative Secretary

Mrs Margaret Morris will be joining the Division from February as our new Admin Secretary. This will be the first day for 1989 for the office to be open again 5 days a week. 11 am to 2 pm for visits and phone calls. (02 689 2417). Until then the office will be open on Wednesday nights 7 to 9 pm and a few other days as advised in the Sunday VK2WI broadcasts, transmitted at 1045 and 1915 hours local time.

Annual General Meeting

Members are advised that it is approaching that time of year for AGM, Council elections and annual reports.

The various dates will be advised in the Minibulletin notes in the March issue of 'Amateur Radio'. Nominations for Council and agenda items for the AGM will close during March and the AGM will be held towards the end of April.

The next Conference of Clubs will be hosted by St George ARS mid April and agenda items for the Federal Convention will be discussed at that meeting.

Group Happenings

The Central Coast (Gosford) Field Day will be held on Sunday 19 February. The VK2WI morning broadcast for the 19th will be aired at the alternative time of 1800 hours on the previous Saturday evening (18th). The Sunday evening broadcast will be as usual, starting at 1915 hours. Mid South Coast ARC will be conducting their AGM at Hancock Ranch, Milton on Saturday 11 February . . . Orange ARC start a Novice course soon, contact Geoff VK2KJX 063 62 7520. Orange ARC will be setting up a stand at the Australian National Sports and Leisure Show on all facets of Amateur Radio, March 10 to 12. Gladesville ARC start their new courses late this month. Video taped lectures also available. PO Box 48 Gladesville 2111 or phone (02) 427 0530 after 5.30 pm.'

Callbooks

The current callbook is still available, but please include $1.50 to cover pack and post. Posted price to Members is $10.00 or $8.50 collect from office. A list of current bookshop publications is included. There are also a few 2 metre handheld (Alinco's) still available, $325.00 plus $7.50 pack and post. Include a current AR address label with orders.

New Members

A warm welcome is extended to the following recent new members.

New Membership Applications

November, 1988

F S. Anderson	VK2MFM	San Remo
S J Aston-Brien	VK2MEM	Orange
G J Butler	VK2XGB	Emu Plains
J P.Csoma	VK2CSZ	Greenacre
L Garron	Assoc	Salisbury Downs
P R.Gibson	Assoc	Alice Springs
O R Heaps	VK2PTO	Hurstville
J C Jennings	Assoc	Blaxland
L G Kihlstrom	VK2FPK	Canterbury
C Lindeman	VK2CKL	Allambie Heights
J Lindstad	VK2WF	North Ryde
M J McNeill	VK2FNF	Angourie

S D Mottram	VK2MCL	Wildes Meadow
D W J Pallister	VK2PDW	Wagga Wagga
J F Pepper	VK2XJP	Kootingal
P G Read	VK2FPN	Dapto
A R M Siede	VK2TAS	Bathurst
S B Timms	VK2MDR	Baulkham Hills
A J Van Der Kolk	VK2XIU	Curl Curl North
R .P Wadey	VK2ELO	Rooty Hill

December, 1988

J P Ayling	Assoc	Maroubra
J Bays	VK2SB	Cammeray
E W Callow	Assoc	Rydalmere
H W Cowled	VK2FUN	Mannering Park
A Dark	VK2XAT	Leichhardt
E S Dening	VK2MFP	Kempsey
W Fiedler	Assoc	Raymond Terrace
M F Haylor	Assoc	Riverstone
C S Higgins	VK2LO	Wentworthville
B.E Horspool	Assoc	Sunny Corner
R Iwasenko	VK2ATC	Engadine
K A Kennedy	VK2PRK	Dulwich Hill
H Lepke	VK2ZHL	Cambridge Park
B Jordan	Assoc	Gladesville
R Loftus	VK2ADG	West Ryde
H Maslak	Assoc	St Marys
B J McNeil	VK2FP	Heathcote
I.R Millhouse	Assoc	Croydon Park
L R Newman	VK2LRN	East Morisset
W J Paul	VK2EXX	Turramurra
S Reisenfeld	VK2FPJ	Broadway
W Steptoe	VK2ZZF	Marrickville
W J Stone	VK2JBS	Wollongong
D Van Dyk	VK2MCM	Dora Creek

January, 1989

R D French	VK2VYE	Blacktown
P J Heggie	VK2ZPH	Thornleigh
P A McGrath	VK2BPM	St Marys
G R Miles	VK2XNI	Scotland Island
C G Palmer	VK2BSD	Hazelbrook
P Sgarlata	VK2DQA	Parkes
J J Toland	VK2XKX	Lismore
D J Vernon	VK2TDV	Gladesville

ar

VK6 BULLETIN

Kalamunda Festival

John Sparkes VK6JX
83 Anemone Way
Mullaloo 6025

20km to the east of Perth is a line of hills called the Darling Range. Lurking amongst the hills and valleys therein are the Hills Amateur Radio Group Inc. Affiliated with the WIA, WA Division, they are an enthusiastic band of amateurs who will gladly push the Amateur Radio barrow whenever the opportunity arises.

To this end, on Saturday 22nd October, 1988 they set up an operational display at the Kalamunda Festival.

VK6YJ, UV and CF were there at 7am to be ready for the 10am start. A tent was erected, and an HF station put on the air with a vertical antenna. Two VHF antennas were made operational - one each for voice and packet radio.

A load of interesting material was put on display with the theme being "Public Education" - or, how to make Amateur Radio come alive for the man in the street.

Highlights of these displays were - Emergency Operations; a large display of Amateur Radio oriented newspaper cuttings; explanations of CW, RTTY, QRP, etc - all aimed at promoting public awareness, and an understanding of what "that bloke down the road with the big TV antenna" does in his spare time!

The emphasis was NOT on picture of 5 element monobanders at 100 feet as this will probably create public animosity - not understanding and awareness.

Other displays included - QSL display, with pointers to the relevant country on a large world may.

A great circle map centred on Perth created a lot of interest - not many people have ever seen Australia as the centrepiece of a world map!

The group had a good location - everyone walking from one end of the Festival grounds to the other had to pass the "shack". About the only problem on the day was PAI - phantom CQ calls were sometimes loud and clear over the Festival PA system! This was not surprising as a quick investigation revealed the PA equipment area was "nest of worms" with lots of resonant dipoles terminating therein!

Other amateurs assisting on the day were VK6SU, HQ and ZTN.

Propagation was awful, but lots of stations were contacted - a big improvement planned for next year will be an external monitor speaker so that the public will be attracted from even greater distances. Possibly a sign could be put up indicating the country currently being worked.

The Group's publicity officer, Norm VK6UV said the Group was very pleased with the response and assures me that after an excellent effort this year, next year's will be brilliant!

I hope you all had a merry and safe Xmas, and may I take this opportunity to wish you all a happy and prosperous new year.

Thought for the New Year

I'd be a member of the WIA even if they did nothing else for me but represent my hobby on an international basis.

What good is a top class QSL bureau if there's no frequency allocations left to QSO on?

73's
John Sparkes VK6JX

Notice of AGM

It is hereby notified that the Annual General Meeting of the Western Australian Division of the Wireless Institute of Australia will be held on the 18th April 1989 following the General Meeting which commences at 8pm. The Meeting will be held at the Westrail Centre, East Perth.

Agenda

1. Consideration of the Council's Annual Report
2. Consideration of the Financial Report
3. Consideration of other Reports
4. Election of Office Bearers, viz. President and Vice President of the Division and seven other Councillors.
5. Election of two Auditors.
6. Appointment of a Patron
7. General Business which has been duly notified.

Notices of motion for the AGM must be received by the Secretary not less than 42 days prior to the meeting and must be signed by at least three members.

Nomination of a candidate for election to Council must be received by the Secretary in writing not less than 42 days prior to the meeting with an intimation that such candidates are willing to act. A candidate may submit a statement not exceeding two hundred words outlining his or her case for election and experience. Each nomination shall be signed by two members proposing the candidate. Candidates must posses a current amateur licence.

Proxies

Any financial member entitled to vote may appoint a proxy, who must also be a financial member entitled to vote, to speak and vote on his/her behalf. Each such proxy must be in the hands of the Secretary prior to the meeting and be in the following form:-

I .....a member of the Institute hereby appoint ..... also a member

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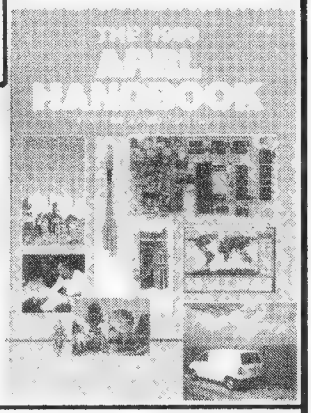

The new 1989 **ARRL Handbook** 1200-page sixty-sixth edition contains over 2100 tables, figures and charts. The new hand book is better than ever with revised information on phase noise measurements direct frequency synthesis and spread spectrum communication techniques. The section on repeaters has been updated including a new CW identifer circuit. You'll find new spectrum analyzer and oscilloscope material, as well as several new projects in the test equipment chapter.
This 66th edition is also packed with information on digital communication modes as well as new power supplies and amplifiers. Ready-to-use etching patterns are provided for many projects.
1200 pages Hard cover Stock #BX160 $46.00

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..... Stock # BX184 $25.00

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held in Arlington, Texas, 23rd - 26 July, 1987 28 papers covering everything from use of TVRO dishes for moon-bounce to a solid state amplifier for 5.7GHz.
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22nd CENTRAL STATES VHF CONFERENCE proceedings
Covers papers submitted for the 1988 Conference. Includes topics on microwave EME, Predicting 144 MHz Es Operings, Match vs. Noise Figure Trade-Offs in Pre-Amps 902 MHz Transverter, Power Amplifier and Antennas, How to Measure Your Own K Index and How to Build VHF/UHF Preamps and much more.
Stock #BX173 $24.00

MICROWAVE UPDATE 1987 CONFERENCE proceedings
Held in Estes Park, Colorado, September 10 - 13, 1987. 17 papers on equipment, antennas and techniques for 902 MHz through 10 GHz. Much information on construction of 2.3, 3.4 and 5.7 GHz gear
136 pages ..... Stock #BX174 $20.00

MID-ATLANTIC VHF CONFERENCE proceedings 1987
This conference was sponsored by the Mt. Airy VHF Radio Club, Oct. 10 - 11, 1987,. 11 papers cover everything from mountian topping to trensceivers for 3400 and 5600 MHz bands
120 pages ..... Stock #BX175 $20.00

* MICROWAVE UPDATE 1988 Proceedings Stock # BX183 $25.00

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COLUMNS

of the Institute to act for me as my proxy and in my name to do all things which I myself being present could do at the meeting of the Institute held on .....
Signed ..... Witness ..... Date .....

VK3 DIVISION NOTES

New Members

The following applications were received for the months of October and November, 1988:-
Accepted by Council 23rd November, 1988.

COOPER, Geoffrey Ronald	P O Box 27, North Altona 3025	-
DIGGINS, Mark Douglas	1 Pembroke Crescent,Cheltenham 3192	-
EBISU, Tsuneyuki	2/57 Albert Street , Mt Waverley 3149	VK3EYD JH3QYD
FLETCHER, Peter Robert	P O Box 221, Rosanna 3084	-
FOSTER, John Gordon	P O Box 352, Hastings 3915	VK3AOE
* GARDINER, Frank Stanley	12 Bailey Raod, Mt Evelyn 3796	VK3VAV
GEORGE, Robert Alexander	RMB 1632, Kyabram 3620	VK3NRG
* HAMLIN, Michael	4 Mullawar Street, Tallangatta 3700	-
HARRISON, E A	36 Elliot Street, Knoxfield 3180	VK3BSD
* HEALESVILLE Amateur Radio Group (HARG)	P O Box 285, Healesville 3777	-
* KAY, Simon Edward	26 Bertram Street, Burwood 3125	VK3XSK
KONING, John	Unit 4, 1 Mais Street, Reservoir 3073	-
* McDONALD, Randall	10 Panorama Drive, North Croydon 3136	VK3RM
MERRIFIELD, Steven John	C/- Post Office, Newlyn 3364	VK3MBO
* MOHAMED, Rashad	5 Gowar Avenue, Camberwell 3124	VK3DIW
O'GRADY, Ron W	P O Box 980, Traralgon 3844	VK6BAM VK3DXY
PEARSON, Donald Eugene	41 King Albert Ave, Leitchville 3567	VK3MCK
* ROCHESTER, Peter	11 Horsmunden Road, Moorabbin 3189	VK3MCD
* ROGERS, Anthony John	10 Balmoral Street, Kilsyth 3137	VK3MCF
* SCHUHEN, Klaus Dieter	30 Bexsarm Crescent, Rowville 3174	VK3KKD
* SWAINGER, Alfred John	28 Lording Street, Ferntree Gully 3156	VK3IP
* TYERS, Peter Dennis	40 Lucknow Street, Ascot vale 3032	VK3VNZ
* WINTERBINE, Vincent	41 Thomas Street, Mitcham 3132	VK3AJO
WOODLAND, Peter Robert	5/14 Legan Road, Oakleigh South 3167	VK3ZPW

* Joined with pink invitation to Join form. ar

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All times are Universal Time Co-ordinated indicated as UTC

Amateur Bands Beacons

Freq	Call sign	Location	Grid square
50.005	H44HIR	Honiara	QI00
50.005	ZS2SIX	South Africa	KF25
50.011	JA2IGY	Japan	PM84
50.013	P29BPL	Port Moresby	QI30
50.015	SZ2DH	Greece	KM18
50.020	GB3SIX	England	I073
50.020	JA6ZIH	Japan	PM51
50.025	6Y5RC	Jamaica	FK17
50.028	JA7ZMA	Japan	QM07
50.029	CTOWW	Portugal	IN61
50.032	ZD8VHF	Ascension Is.	II22
50.035	ZB2VHF	Gibraltar	IM76
50.039	FY7THF	French Guyana	GJ35
50.045	OX3VHF	Greenland	GP60
50.050	GB3NHQ	England	I091
50.050	ZS6DN	South Africa	KG44
50.057	TF3SIX	Iceland	HP94
50.062	PY2AA	Brazil	GG66
50.064	WD7Z	Arizona	EL59
50.065	GJ4HXJ	England	IN89
50.065	NB30/1	Rhode Island	FN41
50.066	VK6RPH	Perth	OF78
50.075	VS6SIX	HongKong	OL72
50.078	TI2NA	Costa Rica	EK70
50.080	KH6JJK	Hawaii	BL11
50.080	HC8SIX	Galapagos Is	EI59
50.085	9H1SIX	Malta	JM75
50.086	VP2MO	Montserrat	FK86
50.088	VE1SIX	Canada	FN65
50.090	KJ6BZ	Johnston Is	AK56
50.092	W5GTP	Louisiana USA	EM40
50.099	KP4EKG	Puerto Rico	FK68
50.100	HC2FG	Ecuador	FI07
50.110	KG6DX	Guam	QK23
50.110	A61XL	U. Arab Emir	LL74
50.120	4S7EA	Sri Lanka	MJ97
50.321	ZS5SIX	South Africa	KG50
50.490	JG1ZGW	Tokyo	PM95
50.499	5B4CY	Cyprus	KM54
52.100	ZK2SIX	Niue	AH50
52.200	VK8VF	Darwin	PH57
52.320	VK6RTT	Wickham	OG89
52.325	VK2RHV	Newcastle	QF57
52.330	VK3RGG	Geelong	QF21
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.435	VK3RMV	Hamilton	QF12
52.440	VK4RTL	Townsville	QH30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.460	VK6RPH	Perth	OF78
52.465	VK6RTW	Albany	OF84
52.470	VK7RNT	Launceston	QE38
52.485	VK8RAS	Alice Springs	PG66
52.510	ZL2MHF	Mount Climie	RE78
144.022	VK6RBS	Busselton	OF76
144.400	VK4RTT	Mt Mowbullan	QG62
144.410	VK1RCC	Canberra	QF44
144.420	VK2RSY	Sydney	QF56
144.430	VK3RTG	Glen Waverley	QF22
144.445	VK4RIK	Cairns	QH23
144.445	VK4RTL	Townsville	QH30
144.465	VK6RTW	Albany	OF84
144.470	VK7RMC	Launceston	QE38
144.480	VK8VF	Darwin	PH57
144.485	VK8RAS	Alice Springs	PG66
144.550	VK5RSE	Mount Gambier	QF02
144.600	VK6RTT	Wickham	OG89
144.800	VK5VF	Mount Lofty	PF95
144.950	VK2RCW	Sydney	QF56
144.950	VK3RCW	Melbourne	QF22
145.000	VK6RPH	Perth	OF78
432.066	VK6RBS	Busselton	OF76
432.160	VK6RPR	Nedlands	OF78
432.410	VK1RBC	Canberra	QF44
432.420	VK2RSY	Sydney	QF56
432.440	VK4RSD	Brisbane	QG62
432.445	VK4RIK	Cairns	QH23
432.445	VK4RTL	Townsville	QH30
432.450	VK3RAI	Macleod	QF22
432.535	VK3RMB	Mt Buninyong	QF12
432.540	VK4RAR	Rockhampton	OG56
1296.198	VK6RBS	Busselton	OF76
1296.410	VK1RBC	Canberra	QF44
1296.420	VK2RSY	Sydney	QF56
1296.440	VK4RSD	Brisbane	OG62
1296.445	VK4RIK	Cairns	QH23
1296.480	VK6RPR	Nedlands	OF78
2304.445	VK4RIK	Cairns	QH23
2306.440	VK4RSD	Brisbane	OG62
10368.000	VK3RGZ	Pretty Sally Hill	QF22
10445.000	VK4RIK	Cairns	QH23

This month's beacon list is one of the longest I have presented for some years. It is necessary that six metre operators, in particular, have access to a world-wide beacon list. With the rapid rise in the solar flux for Cycle 22 as evidenced by the large number of contacts made by VK amateurs using the TEP and F2 modes, during September and October 1988, there is every possibility propagation will be as good or better during March and April 1989.

Ray Clark, K5ZMS, of SMIRK, sent me a world-wide list of six metre beacons requesting an update on the Australian beacons. My list has been sent to him and I have used his list to verify some of the overseas beacons I was going to include in this month's listing.

Ray's list contains quite a number of beacons listed in the USA which appear to be the call signs of the operators themselves. I have included a few of those running reasonable power. Most American beacons apparently operate between 50.060 and 50.080 MHz.

P29BPL appears to have changed frequency to 50.013 MHz.

Hat JA1VOK writes that the list of Australian beacons was out of step with the North and South American and the European lists, as they included power, antenna and grid squares. I am not certain there is a need for listing the power and antenna, but grid squares certainly help to identify more closely where a beacon is situated. Therefore, starting with this month, the Australian beacon list will include the grid squares. Most Australian beacons operate with a power of 10 to 20 watts and practically all have horizontally polarised antennas.

I do not propose publishing this long list every month. This time it will be February and March, then again in September. For quick reference I suggest you photocopy the list and keep it on your operating table. In practically every case, the beacons listed are in continuous operation. I prefer not to list beacons which operate on an intermittent basis or only when the owner is in the shack.

Prompt advice of any changes in beacon status would be appreciated please. According to a letter from Paul ZL1TZA, the beacons ZL1UHF on 51.020 and ZL2VHM on 52.250 are off the air. He made no mention of ZL2MHF on 52.510 so I assume it is operational.

Six Metres

Last month I reported at least six consecutive weekends of gale force winds in SA from mid-September through to early November. Finally the winds abated and David VK5KK was able to climb my tower to the 70 feet position and repair the broken driven element on my six metre beam. The

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next day, 6/11, I was rewarded with the band opening to Japan at 0020, working JA7, 9 and 0, with signals over S9. From 0106 VK4JH, VK4ZJB, VK4KJL, VK4ACE, VK4AMV, VK4ALM and VK4AHW.

Over the past few weeks, I have been able to piece together the extent of the great number of exotic stations worked from Australia, but not by VK5LP!. Although a month late, for the sake of the record, I feel the following details should be recorded and I thank Col VK5RO, Roger VK5NY, John VK4ZJB, Wally VK4DO and Peter VK8ZLX for helping to fill in the blanks.

Early in September it became apparent that the almost daily logging of UA TV on 49.750 would lead to something interesting. A few signals from Japan started around 10/9 and by 13/10 the boys in North Queensland were having daily contacts with Japan, some commencing prior to 0000 UTC and extending through to 0400. On 18/9 VK4ZJB and a VK8 worked HL9CB. Around this time evening type TEP was becoming apparent and JAs were being worked as late as 1200 UTC. Although not worked in VK it was worth noting that JAs worked 3D2ER on 19/9 indicating someone was active from Fiji.

Hat JA1VOK reported that on 27/9 JR6HI in Okinawa worked 5H1HK in Tanzania on 50.110 at 1634 UTC and on 28/9 worked PY2BBL at 0211 UTC, both contacts being first time this Cycle for JA to Africa and South America.

One expects VK4s to work many JAs but it was noticeable that VK3s had almost daily openings to Japan, with VK3AMK, VK3AMZ and VK3XQ really chalking up tallies. They had a good day on 30/9 with the band more or less open all day and into the night until about 1030 UTC. Again the pointer was the Russian TV which was in all day.

1/10 was a day to remember. Warned by Russian TV at 0100 everyone was poised for a great day of activity. By Class 1 TEP the JAs came soon after and for the greater part of the day were S9 plus! All call areas were worked and the opening continued into the night. It was reported Jim VK3AZY worked more than 60 JAs in all call areas in about one and a half hours from 0815 when the propagation had changed to Class 2 TEP. Many VK4s were worked in Victoria and travelling with them was the news that at about 0000 Ross VK4RO had worked K6KST and N6OW. In the absence of other reports this would seem to be the first time VK has worked W for Cycle 22. VK2s were also working JAs.

The excellent conditions continued again on 2/10 with many Es contacts around Australia. The first JAs came in around 0300 and there had been an earlier report of AH6IO working into VK2. Northern VK4 had an afternoon session with JAs. This led to TEP openings later in the day for VK2 and VK3. A report filtered through that Jim VK9NS on Willis Island had forsaken 20 metres and was working JAs on six metres. Heavens, what next! VK8ZLX and VK8ZMA both worked HL9CB during the evening.

On 4/10 HL9CB was reported in Victoria along with some JAs. But on 5/10 the band got going again with JAs being worked by VK2, 3, 4, 5 and 8. Whether they had heard something or were just hoping, several VK4s were observed calling CQ BY. Via 28.885 MHz it was heard that NONQS had heard the GB3SIX beacon on 50.020. It was even reported that Steve VK3OT had worked HL5NAS. The ZLs had been conspicuous by their absence but VK2BA was reported working ZL2TPY late in the evening of 6/10, while on 8/10 VK4RO was reported working Hawaii and Guam.

On 9/10 a report on 28.885 said JAs had worked Chile and Brazil in South America via the long path. Also JA3EGE had worked 9H1BT in Malta while other JAs had used the long path to work SZ2DH in Greece and a Portugese station, all around 2300 UTC. The same day VK4DDG and VK4KU got out the key to work K6MYC and K6HCP on CW.

Lyn VK4ALM must have been thrilled to work ten W6s between 0100 and 0145 on 12/10. Among those worked were K6MYC, K6HCP and K6QXY twice. Around 0230 VK4RO worked K6HCP and VK4ALM rounded off his day by working KH6IAA at 0640.

On 14/10 again via 28.885, ZD8MB was reported working into Ecuador. The next day, 15/10, there were a number of reports that JA2 and JA3 had been hearing both video and audio from European television on 48.240 and 48.250 MHz. KG6DX worked into VK2 during the afternoon and at 1000 had worked OZ7GB in Denmark, crossband six to ten metres.

By 20/10 ZLs were being observed entering the fray with ZL2KT and ZL2CD working into Hawaii. A good day for VK2XJ who worked FK8EM, AH6IAA and KH6JJM. On 21/10 the band was open again between VK2 and KH6 at night.

On 22/10, 23/10 and 24/10 intermittent openings from JA to VK2, VK3 and ZL. 27/10 provided a good JA8 opening to VK3 from 0230. It was learned that Hide JA4MBM had worked W, CT1, SZ, CE, PY, LU and VK for four continents! These contacts gave him 85 countries on six metres. Class 2 TEP provided more JAs from 1000 into VK3, who seemed to be getting more than their fair share of openings. On 28/10 the band opened around 0400 to allow VK4s to work HL2, and VK2s worked KH6 and JAs. On 29/10 VK3AMZ, VK3XQ and others worked KH6IAA and KH6HI around 0230 to 0330. The KH6 stations said they could hear VK6HK and vice versa but were unable to make two-way contact. VK6KXW opened all stops for a contact but failed! At 0330 VK8ZLX and VK8ZMA worked KH6IAA with reasonable signals.

30/10 was a very good day judging by the reports on 28.885 and from VK4DO. W6BJI, W6XP, WA1KFJ/6, K6HCP, K6MYC, WA8LLY/6, WB6VYH and W6HBI were worked from 0030 by VK4DO, VK4FNQ, VK4GM, VK4PZ, VK4DV, VK4DDG and VK4KJL to name a few. From 0219 VK8ZLX, VK8ZMA, VK8KTM and VK8GF worked K6MYC, K6HCP, KH6IAA, KH6HI at 5x9. Neil VK8ZCU at Tennant Creek worked KH6HI at the same time. At 0330 Peter VK8ZLX worked KX6DS in the Marshall Islands. Peter said he had worked three new countries in two days!. VK2XJ, VK2BA, and VK2ZXT and others worked K6CXY and N6AMG followed by JAs.

31/10: At 0215 VK2XJ worked VE5LY with signals 449 each way. Not content with this, Roger went on to work WB6BYA, K6QXY, KH6IAA and rounding off with FK1TK. The VK2 to VE5 contact was the first from VK for this cycle. I have a vague recollection a VE1 was worked from VK in Cycle21 and VEs were certainly worked during cycle 20 back in 1958/59. Congratulations Roger.

From 0500 the band opened to Hawaii from VK2. With the band in such good shape it was not surprising to hear that JA1VOK had worked FT5ZB on Amsterdam Island at 5x9 at 1004 UTC. Reports came in that VK3s were heard in W6 and that WA6 and WA7 had been copied in VE5.

On 1/11 VK2 and VK3 were working KH6 around 0300. ZLs and FK1TS worked VK2XJ. The ZLs came in again at night and some were still available up to 1000. Some Es contacts between VK4ZJB and VK3s.

2/11: News on 28.885 stated JAs were working into VE7 from 0200. VK2s were working ZL1, 2 and 3 from 0130. Conditions on 3/11, 4/11 and 5/11 were showing signs of waning, although JAs were spasmodic into VK2, VK3 and VK4.

On 6/11 VK5LP was able to enter the fray following antenna repairs. JAs were very strong from JA7, JA9 and JA0 from 0020. At 0106 VK4s commenced working VK5. No doubt given some help from Es, the JAs were working VK1, 2, 3, 4, 5 and 7. I learn later some contacts had been made before 2200. VK3 were working VK4. Jim VK3AZY and other VK3s worked KX6DS. John VK4ZJB phoned to say he had worked KX6DS at 0230 with signals reaching 5x9. Others to work him were VK4ZNC (the first), VK4ZMI, VK4APG, VK4ZAZ and VK4PU

before the VK3s took over. Later the VK3s and VK4s exchanged contacts. VK5LP only had spasmodic contacts for the next fortnight, the occasional JAs and VK4s. Col VK5RO said propagation was reasonable at his location, 115 km further north than Meningie and quite a lot of JAs had been worked.

On 23/11 around 0311 the H44HIR beacon was copied in VK4.

24/11 turned out to be a good day. From 0625 VK5LP worked JA1, 2, 5 and 0 at 5x9. using 10 watts. At 0645 Mike VK8ZMA was 5x9. Around 0650 VK5BC, VK5AXV, VK5ZDR and VK5RO were all readable at Meningie via backscatter while they worked JAs. VK5LP worked VK4KJL at 0715 and he reported having worked VK6AMS, VK6KXW, VK6ATF and VK6CC from 0200. On 26/11 JA2 and JA6 around 0700 but signals were weaker than previously. From 0726 VK7 were working JAs. VK2KAJ and VK4KHQ and others into VK5 at 0718. On 27/11 VK8ZLX pounded into Meningie at 0220 and reported he was very pleased with six metres this year. although he agreed contacts had not been so prolific for a few days. 5/12 VK4JH was heard at 0030 and on 11/12 worked VK7ZIF at 0027. Roger VK5NY reported he had worked into HL.

On 12/12 at 2250 VK5LP worked Darrell VK2MZ who turned out to be ex-VK3AQR. Through 0000 UTC to 13/12 and 0038 found the next contact to be with Brian VK4DDC formerly VK2DDC. At 0100 worked Mike VK4DM to give him his first VK5 contact since moving to Queensland from Darwin where he had been VK8MR. Strange to work three stations in succession with changed callsigns. I also received a report that at 2300 on 52.050 VK9YQZ/O from Macquarie Island had been worked. Doug indicated he would be on again the next day at 2300 but band conditions were not favourable, at least in VK5.

13/12: Wayne VK6WD was 5x9 at 0136 and reported Danny FT5ZB on Amsterdam Island was having contacts to JA and 9H1 (Malta). Bob VK6ZFY was a good contact at 0158 and he reported plans were in hand to couple the two Perth six metre beacons on 50.066 and 52.460 into the one antenna via a cavity filter and diplexer to allow checks to be made on differences in propagation between 50 and 52 MHz. Rounded off the day by working VK4ZJB 5x9 at 0120. John said he now had a new call sign VK4KK.

Two Metres and Above

Whilst six metres at this time of the year generally takes the plum for interesting contacts, there are those operators who do not overlook the higher bands. On 12/12 during the mornings there were contacts from VK5 to VK6WG and others at Albany, although I was surprised to find the VK6s rather weak at VK5LP. During the evening around 1100 some enhanced signals were apparent from VK3 with Maurice VK3XVB, Len VK3DLM and Les VK3ZBJ noted. Les was heard to mention a 3 cm beacon he has been working on with the call sign VK3RGV.

South Africa

The "ZS 50 MHz Report" for October 1988 shows that South Africans have been getting their share of interesting contacts across the equator and up as far as Europe. It is not hard to see why. South Africa extends from just above the Tropic of Capricorn down to almost 35 degrees latitude or roughly from just above Rockhampton down to a level a little above Canberra. The island of Malta is about the same latitude as Tokyo. If VK can consistently work into Japan then South Africa should work into southern Europe with as little trouble. And that is exactly what they have been doing.

Through October prefixes they worked included: 9H1, CT1, FC1, FD1, GJ4, I0, F1, G3, F8, F6, I4, F5, 5B4, SZ2, GW, GJ, PA, SV, EA1, CT4, FY7, ZD8, GM3, GW4, and EA7, or 13 countries/islands. In addition, there had been some intermittent operation from ZBO or Gibraltar.

ZD8MB on Ascension Island had 134 six metre contacts from 8/10 to 31/10. In addition to working most of the above prefixes, he also worked LU2, LU9, CX4, TI2, CS8, KP4, PY2, PU3, PP7, HC2, LU8, PY7, YV4, PJ2, LU3, LU6, LU7, PU2, CX8, HC5, PZ1, TI4, KH6, PY5, LU5, P40, VP2, ZX0, F9. The following were heard but not worked: KV, ZS3, XE, FY, TR. Ascension Island is about eight degrees south of the equator and in line with the most western point of Africa, about midway between Africa and South America. Surrounded by thousands of kilometres of ocean, it must be one of the prime six metre locations of the world.

The above two lists represent 60 call areas in 34 countries/islands and indicates how widespread is the interest in six metres. Apparently there are many administrations prepared to allow 50 MHz operation, even if at times with some limitations, notwithstanding the widespread use of television in the same areas.

Through the Editor of AR came a letter from Mike Bosch ZS2FM dealing with a few matters in relation to 50 MHz and South Africa. I quote:

"The 25 watt beacon ZS2SIX on 50.005 at Port Elizabeth transmits 'VV VV de ZS2SIX KF25UX' which is repeated at 25 second intervals.

"Many ZS amateurs are equipped with all mode rigs and scan the spectrum from 50.100 to 50.125. During recent F2 openings many European stations were logged suggesting serious consideration be given to extending the SSB DX section up to 50.200 to avoid future QRM.

"Many more ZS amateurs have 15 to 25 watt 50 MHz FM transceivers. Some are also equipped with four and six element yagis and 100 watt amplifiers and this group are seeking to work FM DX between 50.400 and 50.600 MHz using a calling frequency of 50.400. Recently ZS6CE and ZS6XL worked SV1DO and F5QT on FM at 5x9 both ways.

"A two to six metre simplex repeater system operates at Cape Town. It comprises two FM transceivers coupled back to back. The six metre simplex input and output frequency is 51.400 MHz with an output power of 60 watts to a two element beam. This system can be compared with the two to ten metre FM repeaters in the USA which operate above 29MHz.

"A second repeater system is under construction in Pretoria for 51.500 MHz and a third planned for Port Elizabeth on 51.600 MHz. When the MUF rises above 51 MHz local two metre stations could work six metre FM DX via these channels.

"Please look for FM DX stations on 50.400 MHz and above".

Whilst one can understand ZS stations wanting to work the exotic European DX, the chances of working to VK are not enhanced by most South African beacons having directional antennas pointing north. Omnidirectional antennas similar to those used by Australian beacons would increase the chances of random contacts from areas away from the northern path in both this and their part of the globe.

Other News

Paul Jenner ZL1TZA advises some changes to the ZL beacon listing. He also says that a NZ FM station on 92 MHz combines with NZ Channel 1 TV, both on Mount Te Aroha, to produce a strong FM signal on 52.500 MHz, which could be audible in VK during suitable propagation. The stations have been advised but appear not to be concerned at the mixing!

Paul also mentioned that early in October there was a good two metre and 70 cm opening to VK2 and VK4, with a 70 cm contact to Mackay a possible record. On 25/10 he worked K6 and XE2; on 26/10 five contacts to K6, plus JA, all on six metres.

The small republic of Guinea Bissau on the western tip of central Africa and twelve degrees north of the equator has granted 50 MHz privileges. Dave Heil, J52US, an

American and active on the HF bands from the small State, has taken up the option to operate on 50 MHz, but at present has no equipment. Attempts are being made in the US to raise funds to provide him with a transceiver.

A long letter has come from Peter VK6BWI who has upgraded from a Novice and uses a converted two-way radio with whip antenna on the Busselton repeater (Ch 15), about 50 km distant. He operates from Witchcliffe and is believed to be the most south-western permanent amateur.

The repeater has an output of 10 watts to a 6dB gain antenna. The site is 450m asl, 200 km south of Perth and gives a mobile range of 80 to 100 km. The repeater is under populated and Peter says he is lucky to have two contacts a day. He therefore relies on enhanced propagation to allow stations more distant to access the Busselton repeater.

Believing that the "greenhouse effect" is inevitable, with the weather systems shifting outwards from the equator, Peter poses the following questions:

1. Will static (HF) be more prevalent?
2. Will the TEP on six metres change to put more Australian amateurs within range of Asian stations?
3. Will the MUF be higher?
4. Will there be more or less coastal ducting?
5. What will happen to sporadic E?

Anyone care to let me have some answers?

Calling CQ on VHF

Charlie VK3BRZ has asked me to make some comments in regard to calling CQ on VHF, aimed firstly at newcomers but aware that all might benefit from some of the problems which exist.

Charlie says: "How often do you hear an unfamiliar callsign on two metres or 70cm, calling CQ. As you turn the beam to try and peak the signal, the call disappears into the noise. By the time you swing the beam back in the other direction, the caller has gone?

"Time was when along with your callsign you also gave an appropriate location as well, perhaps not the obscure place you may be operating portable from but the nearest large town. After contact is established, further elaboration may be given if required."

I agree that it would be helpful to know more about a signal during initial reception. For several years, for about a week, I operated portable from a site known locally as Verrall's Hill close to a small place called Field. No one in their wildest imagination could be expected to know from where I was operating if I used those two place names. Thus my call was . . ." CQ de VK5LP/P on Verrall's Hill near Meningie, 115km south east of Adelaide."

(Even though I was 30km from Meningie!) A shortened call was "VK5LP/P at Meningie, south east of Adelaide." In either case it would take very little deduction say, for an operator in Townsville, to know where I was located. What we are really asking is for more information with your CQ call to assist beam headings and give you, at the other end, more chance to make a contact. With relatively strong signals this is not so important as contact can often be made without moving the beam, peaking it later if required. One other point, which I have mentioned before, is to give your call sign many times when calling CQ — I may be able to readily identify the "CQ" but could be having difficulty with the call, particularly if you are one of the many operators who slur their speech. There is nothing worse than CQ called six times and your call mentioned twice!

Closure

My notes for February usually are rather lengthy due to all the activities of the recent Es season and the inclusion of the Six Metre Standings. With a bit of luck, March/April and September/October this year should provide outstanding opportunities on six metres for long distance contacts via TEP and F2 propagation modes. During the next two years I am sure we will also see one or more stations in the northern hemisphere reach the goal of 100 countries verified on six metres, an achievement in itself and one thought largely unobtainable a few years ago.

But there is one thing I don't want to see and that is for overseas amateurs to claim they have worked all six continents without working Australia — some operators have already made such claims in the USA! To work an island in the Pacific Ocean and say you have worked all continents because the island may be in the vicinity of Australia, is just plain cheating and I'll make an issue of it whenever I reach such a claim, by publishing the offending callsign with suitable comment!

Closing with two thoughts for the month: "Let's remember that this ecology business is a matter of trade—offs. A certain amount of pollution in the atmosphere makes for more colourful sunsets" and "Inflation is when the creaking of the pillars of the economic system can't be heard above the rustling of the banknotes."

50-54 MHz standings

DXCC Countries based on information received up to 15 June 1988. Cross-band totals are those not duplicated by six metre two-way contacts. Credit has not been given for contacts made with stations when 50 MHz was not authorised.

Column 1: Six metres two-way confirmed
Column 2: Six metres two-way worked
Column 3: Cross-band (6 to 10) confirmed
Column 4: Cross-band (6 to 10) worked
Column 5: Countries heard on 50 MHz
Column 6: Countries heard on 52 MHz

CALL SIGN	1	2	3	4	5	6
VK8GB	42	42			13	
VK4ZJB	32	32				4
VK2BA	30	30				
VK2VC	27	27				
VK2QF	26	26				
VK2DDG	25	26		2	12	3
VK30T	25	26			10	
VK3XQ	24	26			1	1
VK3AWY	22	22				
VK2KAY	21	23				
VK5LP	21	22			6	3
VK2BNN	20	21				
VK4ALM	20	20				
VK4TL	19	19				
VK7JG	18	20			2	
VK4ZAL	18	18				
VK3AMK	17	17				
VK9XT	17	21				
VK3AUI	17	21				
VK3NM	16	17				
VK4ZSH	15	16				
VK2ZRU	15	16			1	3
VK3ZZX	12	13				
VK9YT	12	14				
VK60X	10	10	1	1		
VK6RO	9	9	3	3	2	3
VK4KHZ	8	10				
VK6HK	8	13			3	2
OVERSEAS						
JA2TTO	48	48				6

A minimum of five countries confirmed (including VK) is required for an operator to be listed.

The list position is determined by the number of confirmed contacts. Where two or more operators claim the same total, those first date listed with that total can only be displaced by another having a greater number of confirmed contacts.

The next list will appear in August 1989 and entries will need to be on my desk no later than 15 June 1989.

Claimants are reminded that full details of all contacts are required; viz: date of contact, time in UTC, call sign of station worked, country, mode, report sent and received, QSL sent and whether received, split frequency contacts should be indicated.

Please add your own call sign, signature and date.

I reserve the right to request and examine any QSL cards which may be needed to support an application for listing. To assist your claim a useful idea is to include photocopies of the front and back of QSL cards.

Kenwood TS-530S Transceiver Improved Selectivity For RTTY Reception

Con Murphy VK6PM

A short note on the above subject appeared on page 18 of the December 1988 Amateur Radio. Unfortunately, it was incomplete. The following gives further details on this modification.

The rig here is a TS530S in which I have fitted the 500Hz filter (YK-88C) primarily for RTTY operation.

Having installed the filter for CW only, I began to wonder if it could also be made to operate with the mode switch in the USB or LSB position. The narrow filter normally only comes into operation when the mode switch is in the CW position and the "Narrow" button is pushed in.

Inspection of the circuit diagram showed that it should be possible to use the narrow filter in the USB and LSB mode if the posts marked SSB-n and CW on the IF board were tied together. When this was done, the YK-88C was now working in the USB and LSB modes when the "Narrow" button was operated.

Selectivity for RTTY operation is now greatly improved. However, the IF SHIFT control must be operated (on the PLUS side) to suitably position the signal within the narrower passband. **ar**

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AMSAT NEWS

Satellite activity

1. Launches

The following launching announcements have been received:

Int'l Number 1988	Satellite	Data	Nation	Period min	Apg km	Prg km	Inc deg
090A	Molniya,3—33	Sep 29	USSR	11h48m	388937	464	62.9
091A	3—33	Sep 29	USA	91.0	336	306	28.5
091B	TDRS—C	Sep 29	USA	1434.8	35803	35719	0.1
092A	Cosmos, 1974	Oct 09	USSR	11h49m	39342	613	62.8
093A	Cosmos, 1975	Oct 11	USSR	97.8	679	649	82.5
094A	Cosmos, 1976	Oct 13	USSR	90.2	396	206	72.9
095A	Radunga, 22	Oct 20	USSR	24h33m	36522		1.5

2. Returns

During the period ninetyfour objects decayed including the following satellites:—

1969—064A	Intelsat 3 F—S	Oct 14
1987—031A	Cosmos 1834	Oct 14
1988—070A	Cosmos 1963	Oct 02
1988—088A	Cosmos 1973	Oct 10
1988—091A	Cosmos 1968	Oct 03

3. Notes

1988—089A NOAA 11

Orbital Elements are:—

Period	102.1 min
Apogee	865 km
Perigee	849 km
Inclination	98.8 deg
Frequency	136.77 MHz
	137.77 MHz

1988—091B TDRS—C

This Tracking and Relay Satellite was deployed from the orbiting STS—26 on September 29, 1988.

Satellite Activity For October/November 1988

1. Launches

The following launching announcements have been received:—

Int'l Number 1988—	Satellite	Due	Nation	Period min	Apg km	Prg km	Inc deg
096A	Cosmos 1977	Oct 25	USSR	1149m	39432	613	62.8
097A	Cosmos 1978	Oct 27	USSR	90.2	394	206	72.9
098A	TDF 1	Oct 28	France	1435.1	35983	35562	0.1
099A	USA 33	Nov 06	USA				
100A	Buran	Nov 15	USSR	See note			
101A	Cosmos 1979	Nov 18	USSR	92.8	432	408	65.0
102A	Cosmos 1980	Nov 23	USSR	101.9	880	852	71.0

2. Returns

During the period one hundred and sixteen objects decayed including the following satellites:—

1966—03A	Cosmos 118	Nov 23
1986—021A	Cosmos 1735	Nov 17
1987—007A	Cosmos 1815	Nov 15
1988—084A	Cosmos 1969	Nov 13
1988—094A	Cosmos 1976	Oct 27
1988—097A	Cosmos 1978	Nov 10
1988—100A	Buran	Nov 15

3. Notes

1988—100A Buran.

This is a reusable orbital spacecraft which was placed in near—earth orbit by the rocket Energiya. After circling the earth twice, it re—entered the atmosphere and landed successfully.

ar

EMC REPORT

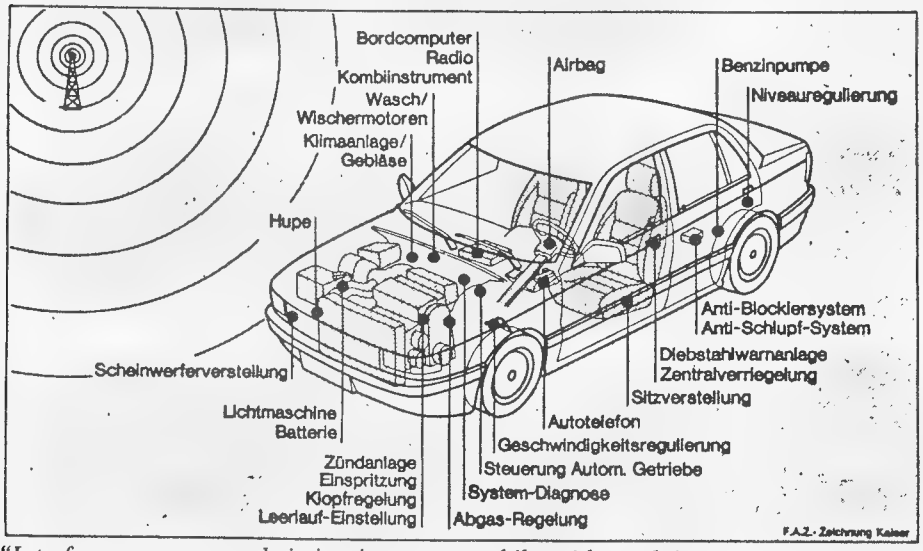
Hans Ruckert, VK2AOU, EMC Reporter, 25 Berrille Rd, Beverly Hills, 2209

Problems with microprocessors in motor cars

The more modern the car, the more microprocessors are installed and the more EMC problems can be expected. The car we wish to purchase may not allow us to use a transmitter in it. "QST" reported that one smart car dealer in the USA recommended to the amateur car owner that he should shield his antenna to avoid interference with the microprocessor which controls the engine operation! More and more car manufacturers will have to shield the car electronics and use ferrite chokes and coaxial filter capacitors wherever necessary.

VK6WQ kindly sent me several pages of the well known West German newspaper "Frankfurter Allgemeine Zeitung", which has a large circulation in DL (and overseas). The full two page publication has the title "Electro-Magnetic Compatibility- Concerto Grosso for Ignition and Microprocessor". There are already EMC problems between the various electronic components within a car, to which we radio amateurs will add those occurring from the rf field of our mobile transmitters. The critical areas within the modern car are shown on the picture. They are, from left to right:

Idling speed control, engine knocking control, fuel injection, ignition, battery, alternator, headlight adjustment, horn, air conditioning and blower, windscreen wiper, washer motor, dash instruments, radio, computer, air bag, petrol pump, suspension level control, anti-locking brake system, anti-slip system, burglar alarm, central door locking, seat adjustment, car phone, cruise control, automatic gears, power steering, system diagnosis, exhaust control. This list may not even be complete. It would seem advisable to take at least a 5 watt hand-held transceiver along when shopping for a car, to find out whether the car electronics causes interference to reception; and whether the transmitter upsets the car electronics under all car operating conditions. There could be surprises for the radio amateur and the other salesman too!



"Interference causes and victims in an automobile, without claim to completeness. Electromagnetic compatibility involves much expense." (Illustration from Frankfurter Allgemeine Zeitung)

HELP!

Have you got six QSL cards?

Have you got six (or more) QSL cards that you could spare to help build up a reference QSL collection for the future?

The WIA QSL Collection curator, Ken VK3TL (ex VK9TL Norfolk Is, CS1TL and C29ED Nauru Is) has donated all 13,000 QSLs to this collection. Many others have donated generous numbers of QSLs but if every amateur could donate only six QSLs that he/she feels would be a most useful addition, what a collection we would have for the future!!! Historians may borrow certain QSLs from the collection and also photostat copies of QSLs can be sent to them free of charge. We want all the cards we can get, but especially welcome commemorative QSLs, special and rare prefix QSLs, especially allocated call QSLs (eg VK4RAN), rare DX QSLs and special event QSLs as well as any VK or pre-War QSL. It doesn't matter very much whether it's the WIA that makes the collection or not, the really important thing is that a collection will be there for the future. There are some VKs who have never seen a PK QSL or even a VQ4. These have gone, never to return. Most of them have been consigned to the tip. Young amateurs know little of the history of DX despite the fact that it is an integral part of the history of amateur radio. We must remember that today's DX will become tomorrow's history - even after a few years.

Our best response has unfortunately been from the widows and families of 'silent keys' who have felt that their loved ones would have wanted it that way. A very special thanks to those amateurs who have consigned QSL cards from their silent key friends to the WIA collection instead of destroying them. There are so many top-class DX-ers in VK land, and although some have played a valuable part, we must say

that we are a little disappointed at the response from this quarter. Nobody can be blamed for holding on to their hard-earned QSLs like grim death, but maybe six wouldn't be missed?? Too much to ask?

Will you help? - Do it today!

The address is: PO Box 1, Seville Vic 3139 Ph (059) 643721 for pick-up or arrangements for the consignment of larger quantities of cards. All donations will be personally acknowledged by the curator with sincere thanks.

SUN SPOTS

Most Intense for 30 Years?

It seems that working DX on the HF bands is capturing the imaginations of both the newcomers and old-timers in the hobbies of amateur radio and shortwave listening.

We are on the upward part of the 11-year sunspot cycle which brings with it improved DX propagation.

The current sunspot cycle forecast to peak late this year could be the second most intense since Italian astronomer-physicist, Galileo first saw the solar eruptions in 1610.

But apart from improving shortwave propagation - some scientists think this cycle's sunspot radiation might knock satellites off course and disrupt long-distance ground based radio and cable communications.

Sunspots emit solar flares, explosions that send protons, X-rays, electrons and other radiation streaming outward, sometimes causing magnetic storms on earth by disrupting the planet's magnetic field.

Predictions that the sunspot cycle would be exceptionally large were first issued in early 1987. But scientists say this cycle won't be quite as large as the 1958-59 solar maximum. The last sunspot cycle peak was in late 1979, and the cycle minimum was in September 1986. The upcoming maximum is expected as early as late 1989; earlier, scientists were forecasting a peak in 1991.Magnetic storms are not dangerous to people on earth. But they pose a potentially lethal proton radiation hazard for spacewalking astronauts and spacecraft electronics. Excess ultraviolet light from solar flares heats the earth's atmosphere, expanding it to produce drag that can make satellites in low orbits fall to earth prematurely.

The US Spacelab fell to earth after an intense solar flare at the peak of the last cycle in 1979.

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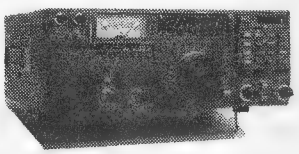
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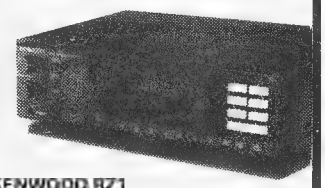
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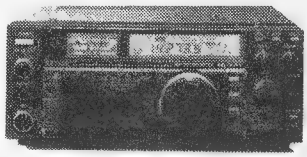
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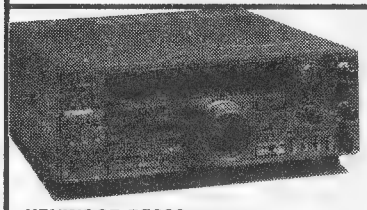
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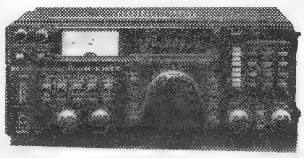
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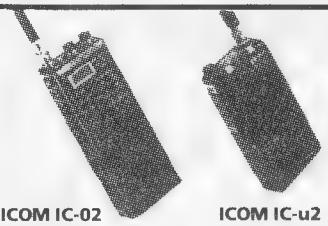
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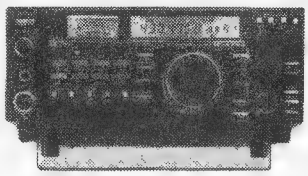
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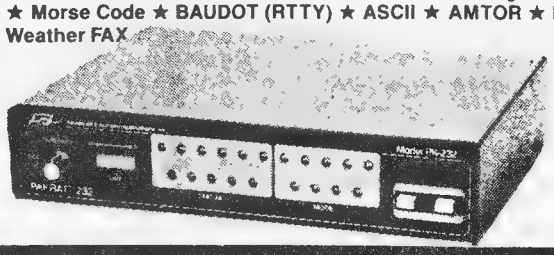

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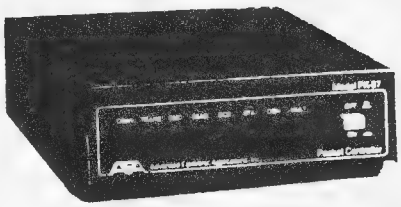

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OVER TO YOU

The six metre band (1)

Rarely do I decide it is time to write a letter to any publication; however, I am moved to do so because of the gravity of a situation which has become very apparent during the past few weeks. I refer to those amateurs who transmit on portions of the six metre band when they are not permitted to do so.

Under the terms of document DOC 71 as issued by DOTC, the band 50.000 to 50.150 MHz may be used without restrictions in VK6. During the transmissions hours of any Channel 0 television station, amateurs in VK5, VK7 and VK8 may use that portion of the band with a power restriction of 25 watts at the transmitter; amateurs in VK1, VK2, VK3 and VK4 are not permitted to use that portion of the band during the broadcasting hours of Channel 0 television stations.

That which is outlined above seems plain enough to me. Yet there are scores of amateurs in those four eastern call areas who appear to be daily ignoring the regulations and operating on 50 MHz when they are not permitted to do so. In so doing, they are placing in jeopardy those negotiations currently proceeding between the WIA and DOTC for a set of conditions which would allow all amateurs to be permitted use of that world-wide segment of six metres.

It is disturbing to note that contacts of a domestic nature (rag-chewing) during Sporadic E openings are being conducted on 50 MHz by amateurs in VK1, 2 3 and 4, when such contacts could just as easily have been made on 52 MHz. To some degree, I suppose, one can understand a brief contact being made with a station in another country or continent. Even that does not condone out-of-hours operating, but to have extended contacts is surely courting trouble.

It must be pointed out that such contacts cannot be considered for inclusion in the Ross Hull Contest, DXCC, WAC, WAS, WAVKCA, Six Metre Standings Lists in both VK and the USA, distance records claims, the newly suggested VHF Field day etc.

Amateurs in the USA and other overseas countries are not going to be very happy when their application for DXCC and Worked All Continents (WAC), which are based upon working some stations in Australia, are refused because the remote half of their contacts were with stations not legally permitted to operate. A letter received yesterday from the editor of a well-known VHF newsletter in the USA said that for some time they had suspected such operations from VK1, 2 ,3 and 4 were illegal and US operators were being advised accordingly and requested to stop working the VKs involved.

From on-air observations, it appears VK3 and VK4 amateurs are the main culprits. I cannot say whether this is due to amore favourable path distance providing more Es openings or whether amateurs, in Melbourne and Brisbane in particular, feel such a sense of relief at having their capital city Channel 0 stations removed, after years of being deprived of general six metre useage, that they have now gone overboard and "to hell" with the rules, simply to satisfy a short term expediency. Is it a case of "we cannot now operate legally at the best propagation times, so what have we to lose?"

This week, in a telephone conversation with the Federal Office of the WIA, I was assured that negotiations were proceeding with DOTC, on this matter of band useage. I was informed the present out-of-hours operations would do little to enhance the VHF amateurs' image and tended to show there were many irresponsible operators in our midst. With discussions at such a delicate stage, it behoves ALL amateurs to play the game according to the rules. Amateurs in VK5, 6, 7 and 8 should refuse 50 MHz contacts with VK1, 2 3 and 4 and the latter with each other.

I know some will say it is all very well for me to speak when I can use 50 MHz (with limited power) and will accuse me of adopting a "holier-than-thou" attitude, but I am prepared to wear this in the over-all interests of the amateur fraternity. My own personal transgressions so far in this matter result from having been involved in three contacts with stations on 50 MHz, at which stage I suddenly realised such contacts should not have taken place. My position as Editor of 'VHF/UHF- An Expanding World" in Amateur Radio demands that I set a reasonable example in operating practices. I am both surprised and disappointed in some of the callsigns involved in these operations - I always believed they would know better!

Not only VK5 and VK8 are concerned, but also VK6, with correspondence and telephone calls to support the concern. Is it a case of "we cannot operate legally at the best propagation times so what have we to lose?" My answer to that is that we have much to lose. During the last sunspot maxima we had no useage of 50 MHz at all with the consequent loss of many good DX contacts. Some of us worked hard to inform overseas countries of our position with the result some good contacts were made because a number of stations shifted to 52 MHz to work us. No such lobbying has been done for this Cycle because of the ability for some operation to take place on 50 MHz. If the impatient action of so many in the eastern States causes all Australian amateurs to lose 50 MHz operating privileges then we will be even greater losers because few overseas stations are geared for 52 MHz working.

With the distinct possibility that we may be close to having a more equitable Australia wide useage of 50 MHz, it behoves ALL Australian amateurs to adhere to the rules and not prejudice our chances of achieving a very worthwhile improvement to our operating privileges, for the sake of any short term satisfaction; that is of course, if an illegal contact gives satisfaction. If a 25 watt power limit was applied to VK1, 2, 3 and 4 on a non-interference basis as in VK5, 7 and 8, it would be a great step forward. Those who decide they must run more power and cause interference should be made to suffer the consequences. I seek your co-operation in giving such a situation a chance to become part of our regulations and to restore my faith in the amateur movement. 73

Eric Jamieson VK5LP
9 West Terrace
Meningie SA 5264

Six metre band (2)

Dear Sir,

This is the first time ever but I must put pen to paper over this issue.

DOTC has in its wisdom provided us with a set of conditions in which we can operate on the band 50 - 50.15MHz. These are set out clearly in document DOC 71 and have been published in both Amateur Radio and Amateur Radio Action; also publicity has been given on the WIA broadcasts.

These conditions may not be to our liking but nevertheless they are the rules.

Still, we see the rules broken daily by stations operating during Channel O programme hours and running far above the power limit provided. Daily we hear on 50 MHz "I am running a pair of 4CX250B's" or "The pair of 4/1000Z's are running cold at 500 watts" or words to that effect.

Surely, fellows, should we not do our bragging about power levels on 20 metres? In fact why cannot we run legally during this trial period?

Do we remember our "horror" when the 11 metre band was taken over by the then un-licensed CBers? Are we any different?

Don't we think we are fortunate to be able to work on 50 MHz at all seeing that we are smack in the middle of Channel O video?

Wouldn't you know that many a bright spark would be claiming new countries and swapping contest numbers illegally?

How silly, nay stupid are we?

Me thinks that before this reaches print we well may have this privilege taken from us.

Colin A Moore, VK5RO
34 Ryan Ave
Woodville West SA 5011

Murphy strikes again

Reference my article "Not Another Article on the G5RV!" in Amateur Radio, January 1989 (front cover is a year behind the inside!).

Thank you very much for printing my article. I appreciate it very much. Unfortunately, as is always the way, I have noticed an error. In the second paragraph which partly reads:

"....From the centre of the antenna, a quarter wavelength of open wire..." should read:

"...From the centre of the antenna, a half wavelength of open wire..." The Table 3 correctly shows the matching line as 0.5 wavelength at 14.2 MHz.

I apologise for any inconvenience which this may cause the reader.

Don Knox VK1DK
79 Harrington Circuit
Kambah ACT 2902

Inflation Control?

During the year I wrote to my local newspaper asking if any of its readers could explain inflation to me. Perhaps the most lucid response came from a former private secretary to one of our late Prime Ministers. Inflation, she said, was just the natural flow-on of the "greed creed", everyone in the community demanding more with or without good reason.

At what stage, I asked myself should I rebel against this phenomenon from which as a retired person I am totally unprotected. I decided that the time was now and I moved quickly to implement this decision including the non-renewal of club memberships and magazine subscriptions. Against this background came the WIA announcement of increased fees and I contemplated taking down my Certificate of Membership which had long held pride of place at my operating position.

But then came George Brzostowski's letter on page 29 of the November issue of Amateur Radio Magazine. His clear-cut statements persuade me to continue my membership. I also see merit in the structure referred to in his letter. The survival of Amateur Radio as we know it today rests with strong, well run local Radio Clubs, offering member services direct from a Federal body, preferably Canberra based.

Organised in such a way, efficiency may arrest this pathetic increase year by year of subscription charges.

Joe Ellis VK4AGL
Burnside Rd
Nambour 4560

Program Update

In the September 1988 issue of AR you published an article by me 'Oh No, Not another log-keeping program!'. Rather to my surprise there was considerable interest in the program, although the article and program were written mainly to illustrate sound programming principles. Users have reported times of half a second to retrieve from disk and display entries from logs of upwards of 1000 entries. Times would be a little slower for floppy disk users.

As a result of feedback from users, several improvements have now been incorporated into the program. It now has the facility to amend and delete existing log entries. The menu system has been completely revised and data entry should also be faster in most cases. The writing of data to the screen has also been speeded up considerably.

For those who acquired Version 1 of the program from me an update to Version 2 is available for $10. This includes the disk, postage and instructions. The disk contains the new program, plus a second program to convert the Version 1 log entry files to the new format. For those who did not purchase version 1, the new program is available for $20, again including the disk and postage.

Kevin L Feltham VK3ANY
PO Box 61
Port Albert 3971

Packet Frequency Advice Please

The Australian Amateur Packet Radio Association is considering the installation of a HF packet network using ROSE nodes to enable packet user groups in isolated areas to communicate with capital city and other isolated networks.

The method of operation would be that an amateur in an isolated area such as Townsville would connect via their local two metre packet repeater to the network and the repeater would make connection on HF to the requested HF repeater node in the destination city. Packets are transmitted by the user on two metres then by the repeater on HF to the HF node in say Sydney and the packets would emerge in Sydney on two metres or on the 70cm links in the Sydney area.

If a path to the requested city was not available due to propagation the repeater would attempt to find a path via previously programmed alternative repeaters.

The most difficult decision to make is what frequency should we use. We wish to avoid the controversy that occurred with the Travellers Net. The proposed bandplan changes give us a guide to what portions of the particular band we should use. The bands which appear to offer the best prospects are 7MHz, 14 MHz and 18.1 MHz. 10.1MHz is not likely to be possible as we have received an indication that as 30 metres is not an exclusive amateur band we would not receive approval. A pity as it would probably be the best band for the distances required. On 7MHz a frequency of 7.030 appears to be suitable and on 14MHz 14.104 approximately could be shoehorned in, but this will require users of 14.105 and 14.103 to use receivers with narrow band characteristics.

The baud rate used would be 600 bd with a shift of perhaps 400 or 600 cycles. The bandwidth will therefore be approximately 1.2kHz which is about twice that of the bulletin boards currently operating on HF. The reason for the wider shift and higher speeds is to provide the faster response and better reliability that is required for attended operation.

We would like to receive comment on this proposal from HF operators generally as well as packet operators as we wish to get it right the first time. As this type of HF network will be a world first we have no overseas experience to guide us.

Packet groups interested in taking part in this network should write to the association indicating their interest. 73

Barry White VK2AAB
AAPRA 59 Westbrook Ave
Wahroonga NSW 2076

Why should you join the WIA ?

Let's run through the immediately obvious things, then go further.

The magazine AR and all of its many features.

QSL Bureaux
WIA broadcasts
Contests
JOTA
WICEN
Callbook
DOC representation
IARU representation
WARC representation.

Now what else?

During the period that I have been licensed-since early 1950-the following changes have occurred (happened?). Been conceived and negotiated would be a better description.

From 14 wpm to 10 wpm for full calls
100 watts to 400 watts PEP
80 metre band
160 metre band
144 and 430 MHz bands and bands up to gigahertz.
The WARC bands
Z, K and N calls with their various privileges.
Multiple choice exams
Revised regulations.

And these are just some of the many gains.

Of my own experience, I can recall many many hours of negotiation with DOC, together with other members of the Executive, which culminated in the issuing of Novice licences and deciding the bands on which they would operate. Is it possible to appreciate the thousands of hours contributed annually by members of the WIA executive, federal councillors, chairmen of committees, the AR editor, federal and state broadcasts, WICEN co-ordinators, state and zone and club committees, not to mention disposals, intruder watch, slow morse, satellite info, muf info, and the many other services which are almost entirely offered voluntarily in your service to that you may enjoy your hobby, in your own way.

WICEN is an organisation which stands ready and well-trained to offer reliable communications in already well-proven emergency-type situations. Their members are prepared to give something back to the community. Amateur Radio is a unique, self-regulating hobby, which anyone with the inclination and the application can enjoy.

But it didn't just happen!

Inaction and non-interest breed loss of privileges.

Changes for the better don't just happen.

Many dedicated amateur radio operators, over many years, have contributed and are still contributing vast amounts of their leisure (for leisure you can also read operating) time TOWARDS IMPROVING the conditions under which we exist and to the reality that our hobby does exist!

Many talented and concerned people are doing their best to protect its existence-on your behalf-each of you-whether you are members of the WIA or not!

The WIA is not perfect and has never pretended to be so. After all, it only represents the opinions of about half of its potential members and they are not always in agreement. But those who are members are making some contribution to the continuing and expanding list of privileges which we, as amateurs enjoy.

If you are not a member of the WIA because you disapprove of its policies or for some other reason, then don't just shrug it off.

If you wish to criticize the actions of the WIA (and I am sure that your constructive criticisms would be wlecomed) then join in at some level, so that you may hear both sides and thus be in a better position to offer a balanced viewpoint.

So, how much better could the WIA be, if it could represent all opinions and be assisted, advised and supported by the undoubted talents of those people who have yet to commit themselves.

Can you, in all honesty, say that your enjoyment of your hobby occurs solely through your own efforts?

Can you not think of some way in which you could repay the Amateur Radio Service for that enjoyment?

Can you not find some way to support the WIA in ensuring that, at the WARC table and at the DOC level, the privileges for amateurs are not only maintained but are enhanced.

Please re-think your reason for not being a member of the WIA and stack those reasons up against the very potent reason why you should be bearing some of the responsibility for ensuring the continuing viability of our very privileged hobby.

Jack Martin, VK5EJ (ex VK3TY)
President of the Lower Eyre Peninsula Amateur Radio Club Inc
P O Box 937
Port Lincoln 5606

QSL procedure

I look forward to receiving my monthly AR magazine and generally find I cannot put it down until I have read it from cover to cover. All appreciated and keep up the good work to all concerned.

I wonder if you can help me. I have looked back through my collection of AR and cannot find an article explaining the ins and outs of how to QSL correctly. If this subject has already been an article can you pleased advise me of which AR it is in. If not as a suggestion this subject could be made into an article for my benefit and many others also.

An interesting itesm was raised in "Over to You" some months ago about a loose leaf booklet for "Operating Manual/Procedures" utilizing a ring binder. With the increase in new operators and also existing operators, subject matter covering modes of operation, frequency allocation (gentlemans agreement), description on how and where to operate on different modes, QSL procedures, etc. would be of great value to all. Even a callbook could be fitted into this system. Once set up cost of maintaining this manual would be cheaper than buying a new callbook every edition, it would be a matter of purchasing the amended pages relating to call signs/procedures.

I realise this would be a tall order to fulfill. How do others feel about this idea?

Jeff Powe, VK4CEM
2 Ulogie Court
Biloela Qld 4715

Prominent Amateurs

The Australian Traffic Net is constantly being requested by the press and electronic media for interviews and information about the hobby of Amateur Radio.

As a result of the emerging media interest in our hobby and activities, we feel it a duty more effectively to communicate with the public through the press about the hobby. Accordingly, I am compiling a file of interesting snippets of information about the hobby and of the kind that the press devours hungrily. During the course of live radio and television interviews throughout Australia and New Zealand, I have sometimes been asked about what well known Australians have been or are licensed Amateurs. It may not, for example, be too well known that country and western star and travelling hypnotist, Robert (Tex) Morton was a licensed ham. I first met him at Gosford (NSW) field day back in the early seventies. There may be others equally well known to the public but whose amateur activity was not generally known. I would also be very grateful for the names of other prominent personalities, not necessarily Australian, who are or were hams.

Can anyone with more information, please write direct to me at the above address. It will help the public identify with

us more closely if they can see that personalities they either know about or love are secretly disguised amateur radio operators at heart...

Robert W Walker, VK2YRX
Australian Traffic Net WIA Liaison Officer
P O Box 279
Drummoyne NSW 2047

Virtually Active

I notice that most DXpedition operators have streamlined QSOs, no doubt in the interest of speed and voice economy, down to suffixes and 59. An improvement on that would be to simply announce all the suffixes in a string with 59 at the end.

Come to think of it, why not make the QSO truly virtual. Just tell all those hearing the call to send the necessary to the appropriate DX manager for a QSL card to be returned - blank so that details could be filled in to the recipient's satisfaction. Even better, an announcement in AR or the like that XY55QRZ will be in virtual operation on 10 or whatever on dd:mm:yy should suffice. Then we wouldn't even have to turn our rigs on!

Rex Newsome VK4LR
58 Prospect Terrace
St Lucia Qld 4067

Reliably Lethal?

I refer to the letter from Graham Rogers VK6RO titled 'Lethal Packet' (Dec 88 AR, Vol 56 #12, p60):

One can then conclude (from the statement that the Royal Navy used packet to receive orders from London) that the British Government apparently feels that HF packet is a highly reliable means of long distance communication!

Brian J Field VK6BQN
Box 102, Wanneroo WA 6065

Olympic Games Traffic Net

At the request of Sam Voron AX2BVS I am forwarding to you a brief summary of the third party traffic net, which was organised to permit such communications by amateurs during the 24th Olympic games held in Seoul Korea. (These arrangements were the result of negotiations between the WIA, DOTC and the Australian administration on the one hand and KARL and the Korean administration on the other. Ed)

Unfortunately, due to commitments with IARN who were providing assistance to Jamaica due to cyclone devastation, Sam was unable to take net control with Korea, and requested that I should take control on his behalf.

Australian amateurs participating were VK6AP Harry, VK3JCQ Carl, VK3PKE Ken and myself VK6RQ Ray. Felix 4Z40X in Kiryat Yam and YB1BI; Harry were also on the net to handle any traffic intended for their countries and to render assistance if required. On the Korean end of the net was YL USUK HL1ATL net control, operating from the Olympic village under the special call sign of 6K24SO.

Only twenty two (22) messages were passed, not a very busy net under the circumstances, but a very interesting one. To pass a message from the participants to their families and then to see them in action in the events was a most exciting experience. The traffic passed was via USA amateurs for countries with which we had no third party agreements, however, as the largest proportion of messages were to and from the USA no message went undelivered.

Looking back through the log I find that the first QSO took place on 17-9-88 on 21.220 MHz at 0900 UCT, and the last took place on 3-10-88. Skeds were daily at 0800 UCT on a nominal freq of 21.160 MHz with extra skeds at 0600 UCT and 2359 UCT if required. The QSY freq was 14.275 if no contact on 21 MHz. Conditions were such that extra skeds and QSY were not required and signals were R5S7 on every QSO. A little difficulty was experienced at first due to Korean accent but this was soon overcome by USUK who spelt out each word phonetically. It of course took a little longer to send traffic, but accuracy was assured.

Usuk who is editorial director of KARL requested QSL cards, and photographs of the VK participants, as she was writing up an article on the net for KARL journal. I received a personal letter thanking us all for our cooperation and that she would be QRV on 14 and 21 MHz for any VK stations who may wish to QSO with her.

A most interesting net which I enjoyed very much.

Raymond Gray VK6RQ
160 Hardey Rd
Belmont WA 6104

OBITUARIES

Jack Pickles VK2YK

With deep regret I announce the passing of Jack in November. Well known for his devotion and operation on CW, and a good friend to many "on air" operators.

One would have to reach back many years to find the beginning of Jack's Radio career. Like so many others from that era, his Radio grounding covered Broadcast, Mercantile, Aeradio, Coastal and his own servicing. Quite unlike anything required these days, but in itself quite as important to the operators of those times. They were days of true communications, with no excuses of "poor propagation" or aerials slanted the wrong way.

His experience was called upon during the War years, when he spent time on an Allied Patrol Boat. His experiences have yet to be written. Sufficient to say, that he was captured and exposed to the wrath of the Japanese which left physical scars to the day of his death. He had his own thoughts of his treatment also. His retirement was spent mostly on the Amateur Bands demonstrating skills and experience learnt over the years. There was nothing Jack could not copy in Morse Code. The best and the worst was acknowledged, and for many years 7025kc was known as Jack's own spot on the dial. Many fortunate operators have found that spot and had the pleasure of working with Jack.

During his latest illness he was ably and kindly assisted by local friends and amateurs and many calls enquiring of his health were asked on air.

SILENT KEYS

Mr EJA Chittick	VK3AUB
Mr CW Savory	VK6ACS
Mr CC Waring	VK3YW

It is with sadness we say goodby to one of the True Greats of Radio Communications.

Gordon Lanyon, VK2AGL

Kenneth John Pryce VK2BNN

With deep regret we announce the passing of Ken Pryce on 21st November 1988 at the age of 48 years after bravely enduring many years of severe physical handicap.

Ken's interests were many and although physically handicapped he was expert at model ship building - manufacturing of jewellery, opal being his specialty and an expert philatelist, to mention a few.

To know Ken personally was an enjoyable and unforgettable experience. If Ken liked you well he might draw a cartooon or two depicting you. Just as you would never want to be.

A sense of humour to be sure, a generous sensitive man, who loved his music and had that special gift of being able to communicate with young children, a much loved "Uncle Ken".

By profession Ken was a tool-maker and then became a very active partner in his family's business in the manufacture of jewellery and dress ornamentation.

After a motor accident Ken's physical mobility became heavily handicapped and he turned his interest towards amateur radio and obtained his first licence in 1977. A limited call VK2ZPP and later elevated to VK2BNN.

Ken could be heard on any band from 80m to 70cm. His favourites were 10m and 6m. It is believed Ken was the first VK to work into Shemya Island WA4TNV/KL7 on 52 MHz. Ken never ran more than 70w pep into his antenna on 6m and although running limited power, he had some 24 countries to his credit on 52 MHz. No mean achievement and this included a confirmed contact into W6 as well.

When not on air Ken might well be found heavily engaged with his computer system; one was not sure who was coming out on top!

Ken will be sadly missed by his many friends and sincere sympathy is extended to his devoted mother - Mrs Dorothy Pryce, his good and ever helpful friend, Joy and to his family in their sad loss.

Vince Angus, VK2VC

Douglas Allan Norman VK3UC

Doug Norman passed away on October 19, 1988 aged 68 years after a year of suffering especially in the last several months but he was never one to complain.

As an amateur radio operator, Doug loved the CW medium, mainly on 14 and 21 MHz for both DX and ragchewing contacts.

In the business world, Doug was an architect by profession and during WW2, served with the RAAF with both distinction and great fortitude.

It never became generally known that as Sergeant Norman, RAAF, Doug's "fist" was that which transmitted the first "Air raid in progress" signal from the mainland of New Guinea, in mid-January 1942, at which time Doug (and the writer) were members of a combined Civil and Service unit, engaged on a "secret" mission, at a point north of Australia.

This writer recollects that Doug, having let the world know of enemy air attacks on our location, dashed out of the Sigs hut in time to see an enemy aircraft shooting over his head into a loaded RAAF bomber (parked in his immediate vicinity) and a high octane fuel dump, all of which exploded in flames so hot that the ground around Doug melted. Fortunately, for Doug, he reached a covered trench in time but could not avoid severe smoke inhalation. Soon afterwards, Doug escaped into the jungle, where for the next 8 months, he wandered and with others eluded the enemy successfully until finally being rescued. For his war effort, Sgt Doug Norman was mentioned in Despatches and received a BEM.

Following New Guinea, Doug served as Signals Officer at Mallacoota (Vic).

The writer offers sincere thanks to Mrs Elsie Norman (Doug's widow) and Ivor Stafford VK3XB (who served with Doug at Laverton HF DF Station) for supplying some of the information used to compile this obituary.

Eric Trebilcock L3-0042/VK5

Phillip C Lewthwaite VK3CCV

My father Phillip C Lewthwaite VK3CCV died on the 7th August, 1988.

He had been a radio amateur ever since I was old enough to have memories and was among the pioneers of radio in South Africa.

After spending time in North Africa, Egypt and Jerusalem area during the Second World War, where he met up with the Australian forces, he returned to South Africa and once more took out his Radio Amateur Licence. He owned his own Radio business until he retired and was very active on the air.

A member of the South African Radio League, he kept exceedingly busy on the emergency network radio, assisting people injured in car accidents and many other difficult problems by relaying the messages to his nearest police station. He lived in both Johannesburg where he used the call sign ZS6XH and in Durban where he was known as ZS5XH. For a while he also operated from Rhodesia as ZE5JR. He enjoyed his radio tremendously. About 4 to 5 years ago he decided to immigrate to Australia to be near my sister Daphne. Dad and Mum eventually moved into a unit in Forest Hill. He did a bit of DX operating under his Australian Call Sign of VK3CCV and also operated on 40 metres whilst in Forest Hill. He was a great deal more active in South Africa before his health started to fail.

Cynthia W Hill VK3EDG (ex ZS6ACT)

Allen George Jacobs VK4BAJ

The untimely death of Allen Jacobs on Sunday, 13th November 1988 was a great shock to all who knew him, especially to members of the Cairns Amateur Radio Club.

Allen, VX136038 originally from Melbourne, participated in WW2 with the 2nd Australian Field Regiment as a signaller, serving in Australia, Papua New Guinea, New Britain and Borneo. The tropics having whet his appetite, he eventually moved from Melbourne to Cairns in 1953.

Allen, a bachelor, when working at a local sugar mill met George Le Grand who, with George's wife Phyl (now VK4CPL) became Allen's "family" and dear friends.

After being introduced to amateur radio at the CARC's display at the annual Cairns show in 1977, Allen joined the club and obtained his Novice call to be shortly followed by his AOCP. He was a loyal and dedicated club member holding the offices of QSL Manager, Awards Manager, Station Manager and WICEN Officer, still holding

the latter position at the time of his death.

He will be remembered for his neatness and discipline in all things tackled and as WICEN Officer for his precise plotting of all northern cyclones, more recently cyclone Winifred at which time sleep was foreign to him.

Allen is mourned by the Cairns Amateur Radio Club and will be warmly remembered by the general amateur fraternity.

Sincere sympathy is extended to his sister Lorna and family in Melbourne and to his very dear friends Phyl VK4CPL and OM George.

Anne Benson VK4FAB

Harold "Huck" Berry VK5JU

It is with regret we record that "Huck" passed away on 21st November 1988 after a short illness. "Huck" received his AOPC and call sign VK5JU in 1930 and continued to be an active operator until a few days before his death. His interest in latter years was mainly on 7MHz.

He was operator of 8GF the station of the Granites (NT) Goldfields maintaining daily schedules with Peter Sinclair at Wave Hill Radio VJD for a period of six months until the position was taken over by the writer.

Apart from "Huck's" enthusiasm for Ham radio, he was also well known and respected in musical circles in Adelaide as an accomplished saxophone and clarinet player and performed in many leading dance bands.

Before taking up ham radio as a hobby, he was keen on motor bike racing and often competed as a sidecar passenger at Sellicks Beach, a popular venue for speed meetings in the 20s.

To his daughter Barbara and family we extend our deepest sympathy.

A.E. Williams VK5BO

Jack Ravenscroft VE3SR

Jack Ravenscroft of Ontario, Canada, fought for the right to engage in his hobby at home, after a court decision put him off the air following an interference complaint from a neighbour.

Jack's story and his costly legal battle through the courts system should be well known to all active radio amateurs throughout the world. It had been referred to a number of times in Amateur Radio magazine.

In a saga lasting three years, Jack was ordered off the air by a lower court. Massive support from Canadian and foreign radio amateurs saw him engaged in a lengthy and difficult preparation for an appeal to a higher court.

A new ruling, while not perfect, made it possible for Jack to get back on air after suppressing his neighbour's equipment against RF susceptibility. The work to suppress the equipment had virtually been completed.

He was admitted to hospital in October after suffering what appeared to be a minor stroke. Unfortunately, doctors found an inoperable malignancy — and he died two weeks later.

Bill Sargent VK3SC

It is with regret that I record the passing, after a long illness of W G Sargent (Bill) VK3SC. Bill came to Camperdown before World War 2 and joined the local hams 3GQ, 3GC, 3GY, 3NY, 3NK, 3WQ and 3PE. He was a very keen AM operator and worked also on CW. He worked here as a radio serviceman. During the war, he served with a radio unit in the RAAF. After the war, he returned to Camperdown and resumed his employment and extending into TV until illness caused his early retirement. Deepest sympathy is extended to his wife Doris and his family, Dawn, Miriam, Bruce and Alan.

Jim Ballinger VK3NK

NEWS FLASH

Rotuma is a new DXCC country

By unanimous vote, the ARRL Awards Committtee has accepted the recommendation of the ARRL DX Advisory Committee to add Rotuma to the ARRL DXCC Countries List. Rotuma is an island located at approximately 285 statute miles north-northwest of Fiji.

DXCC credit will be given for contacts on or after November 15, 1945. Thus, both the recent 3D2XX operation and the 1982 3D2XR operations, if any, will be accredited upon receipt of complete documentation.

QSL cards may be submitted for Rotuma credit on or after June 1, 1989. Cards submitted before that date will be returned with no action.

There are a few DXCC members who have been given Fiji credit based on a 3D2XR or other Rotuma QSO. They may resubmit this QSL card for proper Rotuma credit (along with a Fiji card for Fiji credit) on or after June 1, 1989. For further information contact Don Search, W3AZD, DXCC Manager, at HQ.

What is a "10-10 number?"

Amateurs operating on 10 metres are often bewildered by requests for "10-10 numbers." 10-10 numbers are assigned by the 10-10 International Net Inc. A number is available to any amatuer who works ten 10-10 members and submits the log data to the appropriate 10-10 Call Area Manager. The purpose of 10-10 is to promote interest and activity on the 10-metre band. For further information, send a business-size SASE to Chuck Imsande, W6YLJ, 18130 Bromley St, Tarzana, CA 91356.

From "ARRL Letter", Vol 8, No 1, 13th January 1989

HAMADS

TRADE ADS

RADFAX2: ---Hi—RES radio facsimile morse & rtty program for IBM PC/XT on 360K 5.25" floppy + full Doc. Need CGA, input port, SSBhf FSK/Tone decorder. Has re—align auto—start view same print.
Also
"RF2HERC" same as above but suitable for hercules card, and "RF2EGA" for EGA card (640X350 mode). Programs are $30 each + $3 postage ONLY from M. Delahunty 42 Villiers St. New Farm 4005 QLD. Ph. (07) 3582785.

FOR SALE - NSW

1. — **YAESU FRG7700** with Pre—amp & Handbook $500.
2. — **0—250 kHz** Laboratory Frequency Counter — Period Meter $50.
3. - **Test Set OAFI** Transmit—Receive 10 kHz to 70 MHz AM—FM—CW complete with handbook $400.
4. **Commodore 64** Computer with tape data recorder handbook and three books of software $250.
5. - **Eddystone 770R Receiver** 19 to 165 MHz with handbook $100.
6. **Eddystone 770U Receiver** 150 to 500 MHz with handbook. $100.
7. **H.P. Sig—gen** 10—420 MHz AM—CW with handbook.
8. **AWA Low Distortion** Audio oscillator with handbook $80.
9. **Flexible Heliax** 40m $120.
10. **HT Transformer** 3000V 350mA. $120.
11. **Heater Transformer** 5V. C.T. 15 Amp. $30.
12. **4CX250B** $50.
13. **Hammond L100 Organ** $400.
14. **Leslie Speaker** with inbuilt 60 watt drive Amps $450.
15. **MFJ** CW/RTTY Interface Module for the Commodore 64 complete with software and manual. $240.
16. **Hickock Test Set** Main Frame with plug—ins for 100 MHz frequency counter, capacitance meter. $100.
Ray VK2FW (QTHR) Ph. (063) 653410

ANTENNA TRAP VERTICAL: Hustler 4—BTV 10 to 40 metres in good condition and with Manual. Electronic Keyer, Katsumi Mk 1024 6 to 60 WPM has internal monitor speaker and manual. VK2AXR Al, Tel:- (02) 4776275.

DECEASED ESTATE VK2MCO
1x FT757GSX as new. $1,250.00
1x FT 102 as new. $1,000.00
1x FL100Z as new. $1,200.00
2x MDI Base Microphones as new $130.00 ea.
1xSP 102 as new $60.00.
1xFC 102 as new. $250.00
1x Kenwood R 1000 Receiver $500.00
1x SM220 Monitor as new. $600.00.
1x SP520. $50.00
1x Kenwood DM81 Dip Meter. $110.00
1x CA35 DX 5ELE Tri Band Yagi as new. $470.00.
1x 4 Element Quad Hardware Complete. $250.00
1x Daiwa 1KW CN720 SWR Meter. $140.00
1x Emotator 105TSX and Clamp (new). $400.00.
1x 1KW Filter AP572938. $100.00.
1x KLB 1100DX HF Solid Amp. $150.00.
1x Dick Smith Multi Tester Q1140 (New). $75.00
1x Clipsal Morse Key 610 (New). $50.00
2x .64 Verticals (as new) for 10mtr use. $75.00 ea.
Mrs Pam Welldon (049) 904468
Contact: VK2PKB—(049) 328935 After 4.30pm week days for all information.

YAESU FT200 & FP200 Power Supply, Manual, Mike & Compressor in original cartons no mods as new $275. Complete Set new valves and relay for above $100. 6JS6C Valves $55 pair, 12BY7A (3) $15 ea. IC21A with manual & cables, 7 Repeater & 4 simplex channels as new $140. "Butternut" HF6V Vert. Antenna $210. 30 egg porcelain insulators plus 2 large $10 the lot. Freight/postage extra.
Alan, VK2AHR, QTHR Ph. (064) 959—275.

FOR SALE: TH6—DXX Hy—gain Thunderbird 6 element
3 band beam c/w balun $450.00. Buyer
VK2AYD (02) 452 5441.

TH6DXX: Excellent condition . New traps. All stainless hardware. $500 . Also W.WULF 10m YAGI . Brand new. Needs boom. $85. John. VK2MUV. Ph: (043) 851388.

SIEMENS TELEPRINTER 100: Not working. Manual and demodulator. Any offers. Call in. Nick L20106 2/9A. Old Berowra Road, Hornsby, 2077.

YAESU YO-100 MONITORSCOPE : with cables and manual RTTY facility VK2BKS. Ph: (063) 823069.

KENWOOD TR2400: H/held. C/W. Base stand charger ST-1. Mic. Excel. Cond. $275 Max VK2GE. Ph: (065) 855 732.

KENWOOD SP-930 Comm. Spkr inbuilt. Switchable audio filters. Matches any 8 ohm tour. Exc cond. $150 Max VK2GE Ph: (065) 855 732

YAESU FT 209R: Two metre handheld, YM-24A Remote speaker/microphone, NICAD charger, SB-1 PTT switch with maintenance service manual. $325. KIRT, VK2DOJ. PH: (02) 436 2618.

YAESU FT-757GX TRANSCEIVER, FC-707 ANTENNA TUNER: FP-707 power supply, $1750. 40 foot Telmast $150. Black Products Antenna Unit $100. Mobile Antenna $50. Kenwood GDO $125. Emtron noise bridge $75. Other accessories and test equipment. QTHR Col, VK2CFC. Ph: (02) 771 5708.

VAC. CAPACITORS JENNINGS CERAMIC 25-1000PF 10,000 VOLTS: Brand new . Latest. Suit large linear - ATU. Ph: (02) 918 3835.

TOWER APP 45' HEAVY DUTY TWO SECTIONS TELESCOPIC. Breaks into 4 sections for transport. Winch - $500. Ph: (02) 918 3835.

ICOM. 751 : with voice synth. and additional FILTER . Top condition. $1800. **ICOM 735**: As new. Never used. $1600. Ph: Wal. VK2ZQ (02) 467 2354.

COAX RELAYS N-TYPE 120V COIL: New $20 Heavy duty tower 45' Telescopic 4 sections for transport winch. $500. Ph: (02) 918 3835.

YAESU FT37OR 70cm FM TRANSCEIVER: $380. YAESU FV107 External VFO 5-5.5MHz $50. Chris VK2YMW (02) 692 1473 BH 487 2764 AH

FOR SALE - QLD

AMIGA amateur radio public domain programmes, 3 disks, $20 posted, terminal progs, BBS progs, beam heading & distance calculations, Sat tracking, wefax, morse practice, packet and more. Herb Marriage VK4KM, MS 514, Kingaroy 4610

KENWOOD UHF FM Transceiver Type 8400 mint condition with mobile bracket leads etc. Instruction book in original carton. $350.00
HHW Hansen VK4SV, 4 Bradnor St, Carina QLD 4152 (07) 398 6732

YAESU FV101DM 150 TA7205P IC's new unused. FT101E serv. manual and set of extender boards mint cond. What offers. VK4AJ (071) 284960 Box 373 Pialba 4655.

KENWOOD Hand held TR2600A Extra Battery Pack Mobile MS1. Soft case 5/8 wave antenna & charger. $475.00
4CX250B C/W Socket and chimney new tube $120.00. Sony KX20PSI Profeel Multisystem TV monitor. $600.00. Tom VK4DDG Gold Coast. (075) 339948.

YAESU FT1, including YAESU external speaker and YAESU desk mike. Recently professionally service checked. $2650. Will consider near offer. John VK4SZ. QTHR. Ph: 070 613 286

FT200/FP200 Serial 350273 PSVGC intermittent fault on final bias. RXOK no TX on 15 and 10 handbook ZL Club book G8BI clipper no mike full set new valves including finals make an offer. Allan V Bull VK4FBB. QTHR. Ph: 071-921948

FOR SALE - VIC

SPARE TRAPS for Hygain TH6DXX 10M 878749 15 M 878637 $40 each VK3AQL. QTHR (03) 8578475.

WANTED Vic Bug Keys VK3AQL. QTHR (03) 857 8475

KENWOOD TS180S HF Transceiver fitted with all options. Exc cond. $750.00. 16 Element 2m YAGI exc. DX-Antenna $135.00 VK3DVD QTHR (03) 726 7137

DECEASED ESTATE Shortwave listener: 12 band allwave transistor receiver with digital frequency counter which can be used portable, in car or 240V. $200 ono. Peter VK3VWQ. Ph: (052) 438837.

KENWOOD R-5000 Fitted VHF. VC 20 12VDC attachment. Scan & 100 Mem, New Oct 87 Owner Now VK3EIM. $1,650. Doug 6/3 Winton Rd 3145. 2117219.

DATONG. ACTIVE ANTENNA. AD370. Outside. Receive 0.2/100 MHz. Mains power unit adaptor 11/14V & 9M. Coax. $190. Doug 6/3 Winton Rd, Vic 3145. 211 7219.

KENWOOD TS-520 Transceiver, excellent condition, complete with MC-50 Microphone, Handbook, and 2 new spare 6146 final valves. $500. VK3CO, QTHR

058/25-1585 or VK3CI, Peter, (03) 7284023 after 7 pm.

ICOM IC490: A 70 cm all mode, dual VFO, Memories, scanning, AGC, NB, 10W output inc power cable, manual, mobile cradle. $675 Kenpro rotator KR250, New unused with 10m of connecting cable $180.00. IC202 linear 10w output $20. Roger (VK3XRS) Ph: 051 568291.

KENWOOD TM201B 2MX FM 45watts with all features, with handbook and original carton. $520 ono. VK3AYK QTHR Ph: (03) 5239405.

4 ONLY QB 3.5/750S (4-250S), plus 2 ceramic sockets to suit, all new, never used. Best offer. Don VK3DBB, Ph: (059) 411 351 after hours only, please.

GENERAL ELECTRIC REVIEW MAGAZINES bound in black linen, Hardcovers, Gold printing, years 1925, 1926, 1929, 1931. Complete with monthly covers, advertisements, etc. Excellent condition. Best offer. '73' magazines, 1964-68, years incomplete, 30 issues, $10. Ph: (055) 62 6016

SKILL SNAPLOCK 2-Speed drill, 10 mm, with attachments incl. 5" and 6" circular saws, orbital sander, Jig saw, most parts new. In original boxes, all ex cond. $150. Ph: (055) 62 6016

VK3HM has free old valves, books, mags, tank condx. $15 pair twin cone spkrs. Amer ham radio mags. 88 Egan St, Richmond entry from Punt Rd.

COMPONENTS: (3) 2CW4 Nuvistor triodes $24, (2) 2C39 Triodes $40, Microwave FET - MGF 1402 $25, CX-520D Co-Axial relay $80, 432 MHz to 1296 MHz Tripler with filter $45, 1296 MHz. Inter-digital converter $45. Roger VK3XRS QTHR. Ph: (051) 568291

GRUNDIG GRID DIP OSCILLATORS I & II 100 kHz-8MHz, 3MHz-250 MHz. Orig boxes ex cond $60 ea; Hallam Magnetics Power transformer 240V in 1100V out new $30; Sinclair digital multimeter PDM 35 new $45; Kyoritsu clamp AC volt amp meter new $40; Newtronics swivel ant base new $20. Ph: (055) 62 6016.

LUCAS LAMP or Helio tripod MK1 RMB 1943 $30.00. Contact Bill VK3BWS. Ph: (052) 93337.

YAESU FT2FB 2M, fitted 8 assorted channels includes manual bracket etc. GC $140. STC ISIB 25 watt VHF 10 CH Mobile on 2 metres has CH 40 C/W Manual spare boards etc. GC $85. Heathkit HW100 HF SSB XCR, Valve Unit, No case or manual needs TLC. Offers? Jeff Sparks VK3ZJS. PO Box 86, Riddells Creek 3431, Ph: (03) 6107116 (BH), (054) 286309 (AH).

DSE 15M MONOBAND transceiver VFO, Digital display, with microphone and manual $280 DSE "Centurion" 12V/2A regulated PSU, excellent condition $40 "WPO' 15M QRP Transceiver DC Receiver, DSB/CW FET Transmitter, VFO, Digital display excellent condition, manuals $120. Bob VK3BMA QTHR. Ph: (03) 657 3708 (W)

FOR SALE - SA

YAESU 430 MHz transverter module. Has Ga As FET front-end. Suits FT-107/R, FT-901/R and FTV-707. Hardly ever used, original packing, hard to obtain unit. $220. VK5WD Ph: (08)2511093

TRANSMITTER 6V6G osc 6V6 Dblr 6V6 Dblr 807 buffer 829 PA 160 to 6 MX (750-CT-750) on final. TX Tubes 4-65A, 4E27 (813); 829B+socket VCR 139 & Socket; Grundig reel to reel recorder (valves) Post War Tubes RX & TV. VK5LC. Ph: (08) 271 6841. Les E Catford.

FOR SALE - TAS

KENWOOD TS68OS 160-6m T/CEIVER: Inc. GEN/COV. receiver & 6 meters. New. $1530. Tokyo. HY-Power HL1KGX 160 Inc.WARC Linear Amp Inc. New 4CX250B tubes Linear built in power supply 1200W input.
New $1560 003 317914 VK7AN.

YAESU: 730R 70CM FM $400 ONO InfoTech multi mode code receiver TOR ASCII Baudot $400 ONO ICOM R71A $1200 YAESU FT-101 $250 70CM Power amp. $80. Ph: VK7PU (004) 313020.

WANTED - QLD

TV 502/TV506 T'verter or IC202/IC502 will pay reasonable price reply to VK4-DXD 9 Thomas St, Narangba 4504 Ph: (07) 8881904

YAESU Transverter for FT107. 144/50 MHz option desired. Working condition. Noel, VK4BIF, QTHR or 265-5052.

WANTED 2 Tubes 3A4 to restore army 128 set also manual or details WWII army AT21 transmitter VK4EF 97 Jubilee Tce, Bardon, Brisbane 4065. Ph: (07) 366 1803 AH please

WANTED 'Expanse' AWA Morse hand key WWII. Also semi-auto keys. Any type, condition. VK4SS. 35 Whynot St, Westend, Brisbane 4101.

CIRCUIT AND/OR MANUAL FOR WESTON RADIO TELEPHONE: Type L M 52 or any information. Willing to bear the cost. J. Gacesa, 37 Bandara St. Wacol 40076. Ph: 2712692

DICK SMITH COMMANDER 2M TRANSCEIVER: Any condition. VK4DI QTH-R. Ph: (079) 22 4402.

WANTED - VIC

BOOK Handbook of electron tube & vacuum techniques by Fred Rosebury. Price to: John Lundy

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

Call Sign (if applicable): .....

Address: .....

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State and Postcode: .....

VK3AZ 8 Arlington Court, Dingley Vic 3172, Ph: (03) 551 2873

WESTON 661. Commercial UHF FM Mobile transceiver. 25 W approved to RB. 234. Designed with separate transmitter & receiver sections so can be used as fixed station/repeater. To swap for a medium duty antenna rotator, any condition but must be working. Danny VK3KKW. Ph: (03) 749 1476.

WANTED Servicemens Technical information sheets, Service Manuals, Data Sheets, Books etc. for valve type broadcast receivers 1930's to 1950's. Ralph VK3CQK, QTHR. Ph: (058) 521372.

WANTED VIC Rotator Stolle or Tandy Archer C/W control box in working order. Ph: (03) 8791896 VK3BK Peter QTHR.

A SPLIT PHASE 24 volt AC Electric Motor, to suit a DAIWA DR7600X Antenna rotator. Ph: Vincent 8732301 VK3AJO. 41 Thomas Street, Mitcham, Vic 3132. Area Code 03.

WANTED - ACT

INSTRUCTION MANUAL : (Tube element settings) for U.S.A. Lafayette Tube Tester Model TE-55. Company out of business. Will pay photocopy and postage costs. Please help! Jock Fisher. QTHR. Ph: (062) 86 6920 anytime. VK1LF.

MICROPHONE: Kenwood desk-top type MC-60A . Price and condition to Jock. VK1LF. QTHR. Ph: (062) 86 6920.

HAMAD WANTED: 2M radio for packet. Xtal control acceptable. Must be reliable. Kevin VK1OK. Ph: (062) 54 7129.

NALLY TILT OVER TOWER: Unused in as new condition. Surplus to requirements. Contact Richard VK1UE . QTHR.

WANTED - NSW

MICROLOG AIR-1: CW, RTTY cartridge for Commodore C64 computer. VK2NW QTHR Ph: (02) 464358.

FTDX401 TRANSCEIVER : In working condition . VK2BQQ . Ph: (02) 9576808.

WANTED KENWOOD TS-130s OR TS-120s: Frank VK2CWL. Ph: (068) 890535.

YAESU FT301 HF TRANSCEIVER WITH MATCHING FP301 POWER SUPPLY: $600 . Ph: (047) 514257 for on air test or further details John VK2VJD QTHR.

WANTED - SA

SWAP SALADMASTER COOKWARE SET: 21 piece 5 ply stainless steel, brand new, never used - for late model HF transceiver. Will pay cash difference. VK5KBE. Ph: (08) 250 7259.

FOR SALE - WA

PACKET TERMINAL PACCOM TNC 220: with extra H.F. tuner Inbuilt, cost $425. Sell $300. Amstrad CPC 6128 computer, monitor., disk drive, RS232 interface, 25 discs $950 or partex H.F. transceiver plus cash. Transport arranged at cost. K Bainbridge VK6XH (Formally VK6BRK) (09) 279 4923

WANTED - TAS

1296 MHZ 432 MHZ TRANSVERTERS: 144 or 28 MHz IF. Need not be state of art must be GW0 Wayne VK7WD QTHR . PH: (002) 672356 A.H.

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HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclosed a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.

*A courtesy note will be forwarded to acknowledge that the ad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.

Conditions for commercial advertising are as follows: $22.50 for four lines, plus $2.00 per line (or part thereof) Minimum charge — $22.50 pre—payable. Copy is required by the

Deadline as indicated on page 1 of each issue.

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❑ For Sale
❑ Wanted

Name: .....

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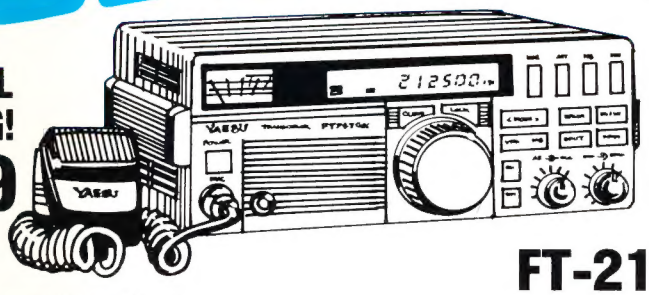
YAESU

Proven Performance

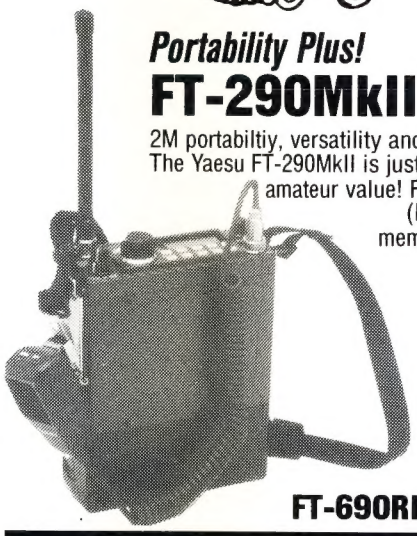
Yaesu's Budget FT747GX:

IDEAL FIRST RIG!
$1349



Everything you need without the frills! Yaesu recognised the fact that amateur transceivers were getting out of the reach of the average person. So they did something about it: The FT747GX. A full 100 W with all amateur bands between 1.8 and 30MHz SSB, CW, AM and optional FM; receiver is 100kHz to 29.9999MHz continuous. If you're looking for value along with performance, there's simply not a better rig than the FT747GX; anywhere! Cat D-2930

FT-211RH 45W 2M Mobile Transceiver with mic, mounting bracket. Cat D-3493 **$675**
Plus bonus 5/8 wavelength antenna Cat D-4207 ***(Save $15)***



Portability Plus!
FT-290MkII

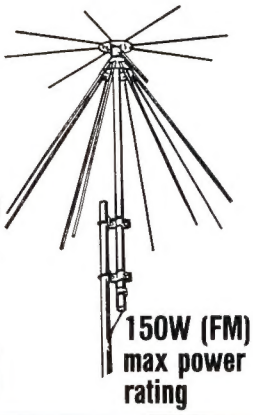
2M portabiltiy, versatility and performance at its best, The Yaesu FT-290MkII is just what you need for real amateur value! Features include All Mode (LSD, USB, CW & FM), 10 memories, 2.5W output, twin VFO's and much more. Cat D-2875

$875

FBA-8 Batt Holder optional Cat D-2876 **$49.95**

FT-690RII also available **$899**

Broad Band VHF/UHF Discone Antenna



Use it for transmitting and receiving! Save $40 on this high quality, Japanese made, broad band discone antenna that covers scanning, 2M, 70cm, UHF CB... the lot. 3dB gain and less than 1.5:1 SWR between 80 & 480MHz! Sensational value at this astounding low price. Cat D-4315

Was $169 Only $129

150W (FM) max power rating

And the ultimate HF/VHF/UHF transceiver: FT767GX

With bonus microphone!

Combine the best features of the renowned FT-757GX with the FT-726 and what do you have? The all band FT767GX. DC to light (well, almost) covering all HF, VHF and UHF bands up to and including 70cm!
Sure, the FT767GX isn't cheap. In any sense of the word! It has all the features and performance you'd want from your amateur station — because it is a complete amateur station — in one! Cat D-2935

$4595

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• Every amateur band between 160m and 70cm!
• A complete amateur station in one handy package!

DICK SMITH ELECTRONICS

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Icom have packed so many functions into the IC228A and IC3210A mobile transceivers, you'd think there was no way you could still make them so compact. (It might explain why nobody else has made a transceiver with so many features.)

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With all these functions in one small compact mobile, it really is a wonder they're still so compact and mobile.

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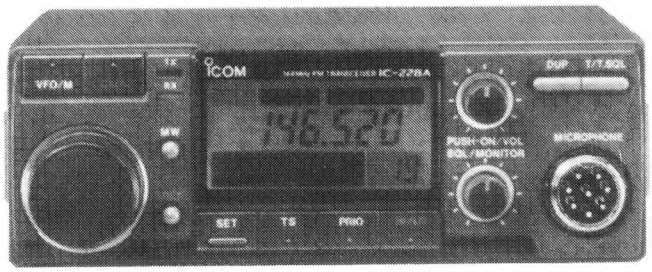

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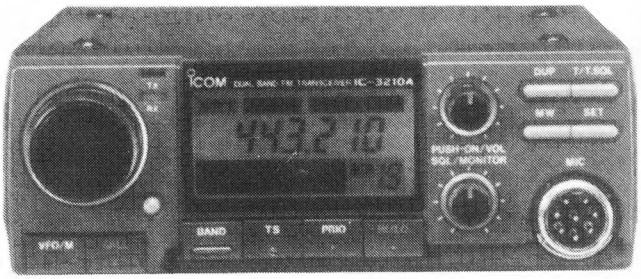

IC3210A

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